THE IRON AGE

May 14, 1931

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PIPE LINES IN THE LIMELIGHT

A MANUFACTURER of a certain material used in pipe line construction told us he found The Iron Age an unusually valuable source of information on new pipe line projects. Until two weeks ago these pipe line items appeared in the Plant Expansion and Equipment Buying section. Acting upon the suggestion of this manufacturer, we are now segregating these items. You will find this week's list on page 1647.

If it is to your interest to keep in touch with new construction, it will pay you to go over the weekly lists of fabricated structural steel and reinforcing steel projects and awards, the pipe line list, and the Plant Expansion and Equipment Buying Section.

—A. H. D.

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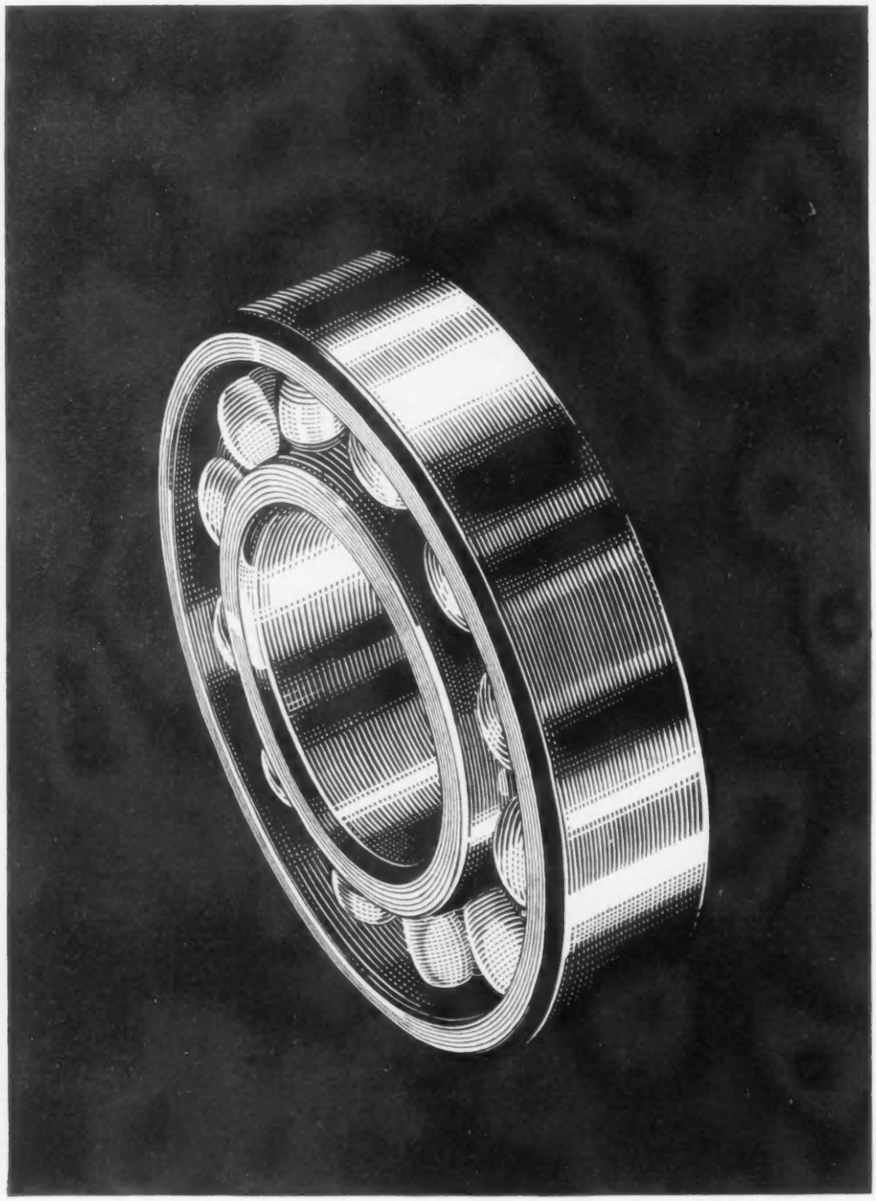
76th IRON AGE YEAR

NEW DEPARTURE BALL BEARINGS



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THIS ISSUE IN BRIEF

MAY 14, 1931

How Wood Is Made "Firesafe"

Planks are loaded in large cylinders. Vacuum pressures are followed by reverse pressure and wood is impregnated with fire-stopping salts. It will not sustain fire.—Page 1579.

* * *

New and Growing Market for Steel Products

Scaffoldings and other contractors' equipment are being made of steel instead of wood. The metal equipment is fireproof, more quickly erected, high in salvage value, and economical to maintain.—Page 1577.

* * *

Rural Factory Workers Less Affected by Depression

Almost all employees do some farming. Work is rotated so that few employees have to be dropped. With manufacturing and agriculture being carried on side by side, the lot of the worker is infinitely better.—Page 1583.

* * *

Saves Current in Enameling

Heating chamber of burning furnace is horseshoe-shaped at rear end. Front part is divided by a brick wall in which open arches permit heat to pass from outgoing work to incoming work.—Page 1587.

* * *

Sand-Blast Operators Control Conveyor with Push Button

When additional pieces are needed for sand-blasting, the sand-blast operators press a button, moving conveyor forward a few feet, and bringing additional pieces within their reach.—Page 1589.

* * *

Stockroom Elevator Truck Runs on a Track

Loaded tote box is raised by elevator, operated by push-button control, to level of tier in which it is to be stored. The box is then pushed off on to the storage rack.—Page 1590.

* * *

Heat Absorption Rate Independent of Mold Wall Thickness

Rate of heat absorption is independent of the wall thickness, and a thin mold cools the ingot just as quickly as a thick one. After the lapse of some time the thin mold dissipates heat faster, but so long after that the ingot structure is not affected.—Page 1592.

Slow Teeming Minimizes Surface Cracking of Ingots

Molds expand not only outward but also longitudinally. In early stages of teeming the ingot skin adheres to mold wall. Mold surface is expanding. If skin is too weak to resist the stretching it may break.—Page 1593.

* * *

Mold Wash Preserves Mold

It also tends to prevent surface cracking, as it hinders close contact during the early stages of teeming.—Page 1593.

* * *

Cracks Detected by Magnetized Filings

Iron dust clings to the edges of magnetized cracks in welds, ground surfaces, forgings, etc.—Page 1594.

* * *

Mold Output Quadrupled by Sand-Handling System

Two sand-handling units, installed in Canadian steel foundry, permit flexibility in the blending of different grades of sand used. Expenditure of facing sand and gaggers has been reduced, and castings are smoother.—Page 1600.

* * *

Forecasting Consumption Mitigates Severity of the Business Cycle

Producing more than can be consumed is uneconomical. Forecasting consumption is extremely difficult, but close contact with market permits a fairly decent guess as to what the sales volume will be.—Page 1583.

* * *

Pension Plan with No Fixed Retirement Age

In farm implement plant every employee who has given 25 years of satisfactory service is eligible. Each case is considered on its merits.—Page 1582.

* * *

Sprays Enamel on Parts "in Transit"

Chain conveyor carries parts through a booth so that edges may be sprayed with black enamel while the piece is moving. One burning operation is saved by spraying the edge before the first burning.—Page 1584.

▲ ▲ ▲

NEXT WEEK

▼ ▼ ▼

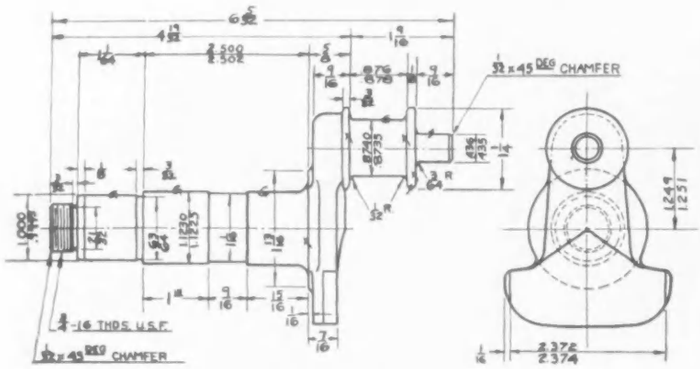
NON-DESTRUCTIVE testing of materials has been specially studied at the Naval Research Laboratory, and one of the articles of the next issue will be devoted to the use of gamma rays in this connection.

A wage incentive system and in that connection a system of cost control are noteworthy features of the management of a machine tool builder to be explained next week.

▼ ▼ ▼

Doing a good job cheaper, and better, by PROFITABLE REPLACEMENT

. . . at the Syracuse Washing Machine Corp.,
Syracuse, N. Y.
Mfrs. of EASY washers and ironers



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Former Time,
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Present Time,
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Time Saved,
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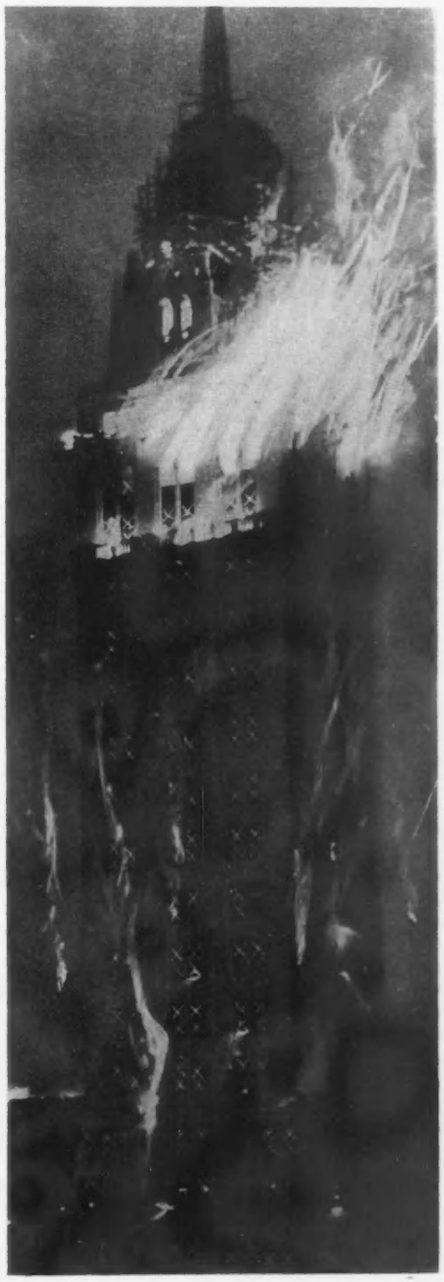
..THE IRON AGE..

ESTABLISHED 1855 NEW YORK, MAY 14, 1931 VOL. 127, No. 20

CONTRACTORS' EQUIPMENT INCREASINGLY OF STEEL



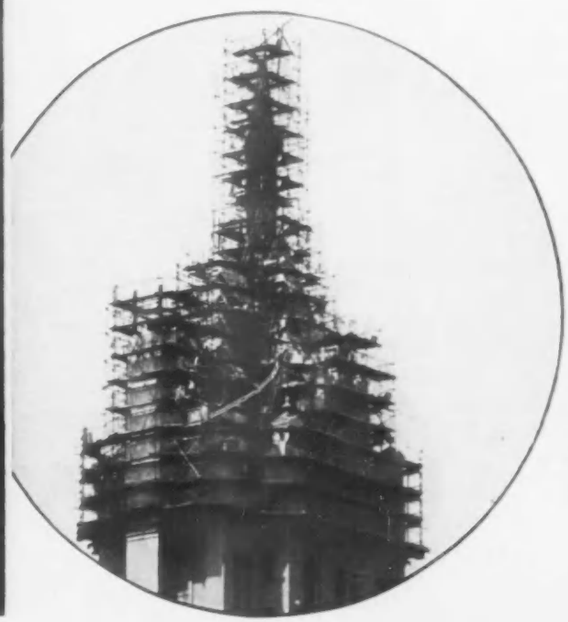
By GEORGE G. WHEAT

STEEL scaffoldings, steel-framed sidewalk bridges and canopies and steel hoist towers for materials hoists, used in building construction, have been a recent adoption. Their use has proved so satisfactory and safe that this new equipment is now popular and the use is extending rapidly.

It may seem a bit odd at first thought that, although the steel frame has ruled building design since its introduction in the 'eighties of last century, yet it was not until this recent period of very large commercial buildings that this steel contractors' equipment was brought into use.

About four years ago a steel post and steel I-beam sidewalk bridge was erected for a contractor's use in Chicago. This is reported to have been the first. The bridge was so sightly and strong and safe that the vogue has spread. One now so rarely sees the older type in our larger cities that we have almost forgotten how it looks.

Steel scaffolding has been used for some few years in build-

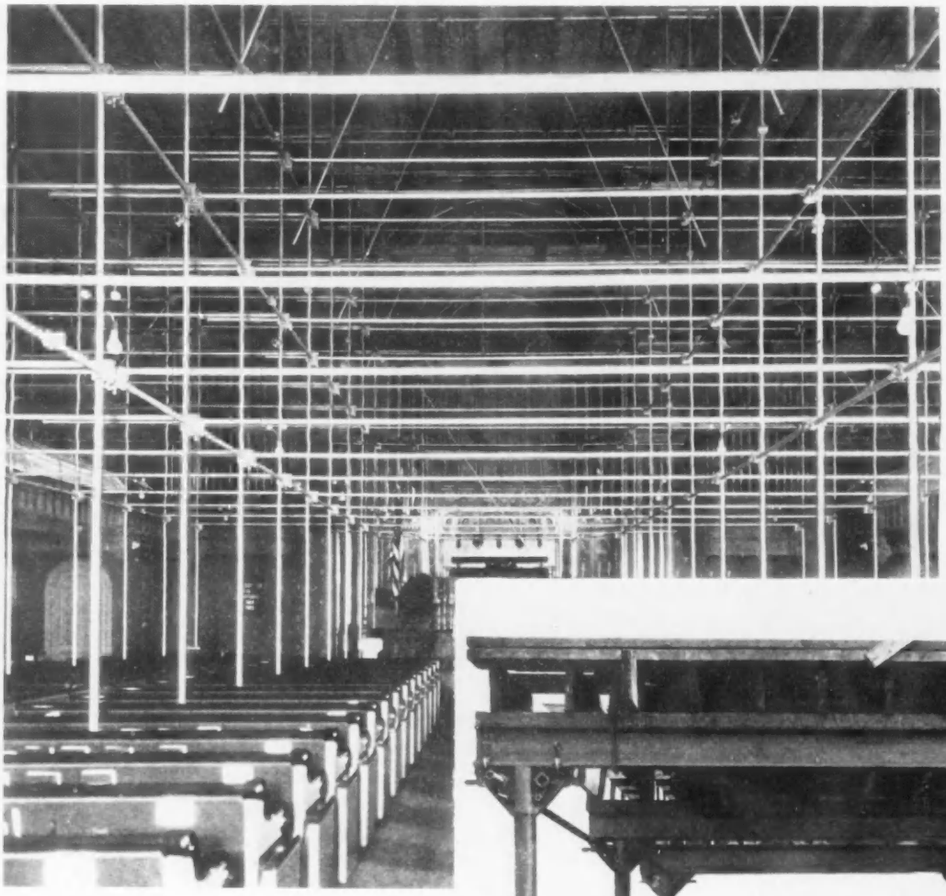


CAUSE and effect. Fire destroying wooden scaffolding and part of tower of the Sherry-Netherlands Hotel, New York. At right is the steel scaffolding put up after the fire, to prevent a recurrence.

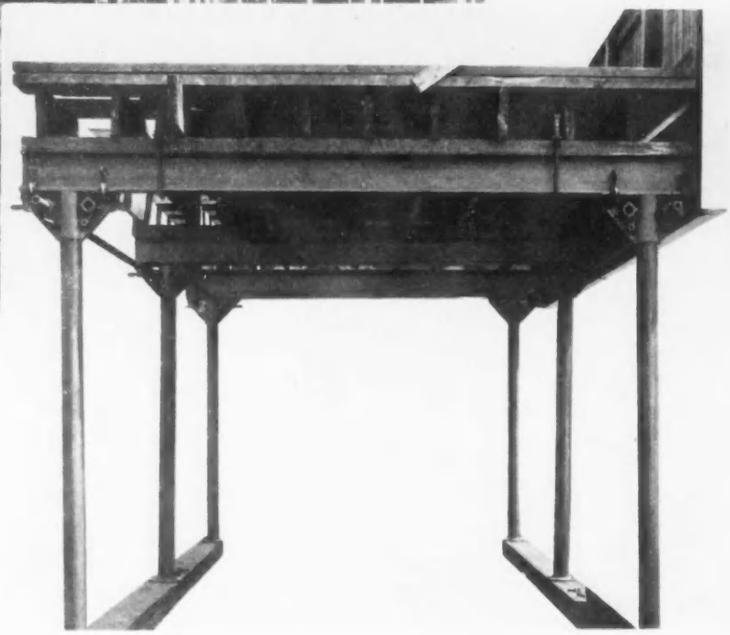
ing, maintenance and cleaning work. England is said to have led in this. But steel scaffolding was used first in New York following the spectacular fire, April 13, 1927, in the large volume of wooden scaffolding surrounding the nearly finished tower of the Sherry-Netherlands Hotel. This fire spread to the wooden hoist tower downward, and did a damage of more than $500,000, besides causing a considerable delay, and therefore added cost, in the completion of the building.

Yet another and a more serious fire came in the Riverside Church in December, 1928, when a large amount of interior wooden scaffolding burned, spreading to the outside and doing altogether more than $2,000,000 damage, besides causing a long delay in completion of the structure.

First use of the steel tower for material hoists came with the Chanin Building, erected in 1928-1929. Although some use of single towers for concrete work in low industrial building construction had earlier existed, yet its suitability for handling the large amounts of material in very high buildings was first demonstrated in a complete way on this first New York job.



INTERIOR of Marble Collegiate Church, New York, showing framework of scaffold used in redecorating the ceiling. This is made up entirely of pipe, with easily-applied clamps joining the pieces and providing the stiffening necessary.



SECTION of sidewalk bridge on a building job, showing use of steel columns as supports and of I-beams surmounting these columns to take the loads above. Method of joining is shown clearly at top of columns. (Below)

Contractors Now Rent Equipment

In these three years past the extension of use of this steel equipment has grown rapidly. At this date the leading cities of the United States have generally begun to use the steel type. It would be idle to make forecasts, but the results thus far show that the demand has kept the contractors' equipment companies taxed—to make the change over from wood to steel as rapidly as required, and to

meet the additional demands now growing for additional steel equipment for mechanical or protective uses during construction work.

One other significant change is taking place, also. This is that more and more general contractors are closing out their own departments providing this type of equipment and relying upon the special equipment companies to supply their needs. Recent very large structures in New York were built without the general contractor owning even so much as an office desk on the job. This condition means much for the growth of this industry of supplying steel equipment for construction work.

A few words about the preparation which has made possible the quick entry of this steel equipment seems fitting. While it is true that some previous uses are known, and that England had used steel for several years, yet the adaptation to the American type of tall building had not been made.

But our American firms had been making extensive and intensive engineering studies. Much detail was ready in blueprint form, and some experimental scaffoldings had been erected and tested. Mill and factory connections had been made, also, and when the emergency came, telegraphic orders to supply materials were sent and almost overnight the change-over began. This explains the smoothness and speed with which the steel scaffolding was supplied, following the first serious fire and the resulting demand for a change.

We humans usually wait until something forces us to change our methods and practices. It seems we must be shocked by some sort of disaster, and possibly shocked repeatedly, before we make the necessary effort to effect the changes. This short article is not a preachment but this human factor is, after all, a very essential consideration when we observe and record such progress as this long-delayed change-over represents.

Before the steel-framed sidewalk bridge was used in New York several serious accidents, with some fatalities, had occurred in the city. Derrick loads of steel members had fallen and several very troublesome fires in wooden bridges had occurred. However, when a load of steel beams fell upon a steel-framed bridge, and the bridge steel members acted as a shock absorber and protected even those under the bridge, the contrast between this and an earlier like accident when lives were lost was much commented upon in the news. This served to establish the steel-framed bridge firmly in favor.

Tubular steel is the key shape for the construction design for all vertical set members, and for the horizontal members of scaffolding and towers. The typical I-beam is, of course, used for the load-carrying members, such as those in sidewalk bridges. But light canopies over sidewalks use tubular steel throughout.

Fastenings are by clamps and bolts. Malleable heat-treated castings and also drop forgings are used for all angled couplings, while the straight jointings are by two methods. Towers use the sleeve joint for verticals, and scaffoldings use a locking gudgeon and socket joint.

Erecting a tall building at corner of Forty-second Street and Fifth Avenue, New York. Steel scaffolding is used throughout the height and the face of this building, from a point about three stories above the street, as shown. A second installation of scaffolding appears around the corner of the building, at left. Safety rails are a feature in both cases.

Footing for Workmen on Scaffold

At this date the wooden planking still holds favor as giving the best non-slip footing for the busy workmen, who must make so many quick motions and not be bothered to watch their footing grip. These plankings are now made "firesafe." A description of the process would be intricate and a bit must suffice.

Planks are loaded upon steel "cradle" cars and run upon rails into large cylinders. Then, first by vacuum pressures followed by a reverse pressure and the entry of impregnating solutions of fire stopping salts, the wood is rendered entirely proof against self-sustaining fire. In a second like cylinder a process of impregnation with silicate salts to seal the fireproofing against weather is given to the planks.

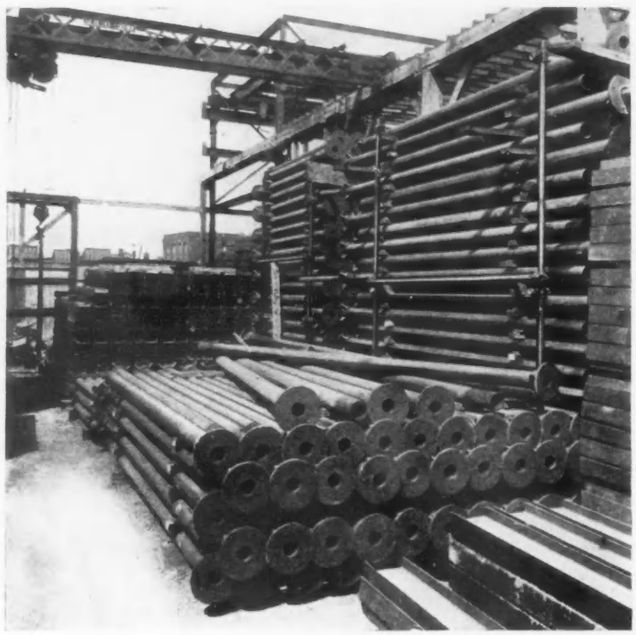
Salvage of Equipment Important

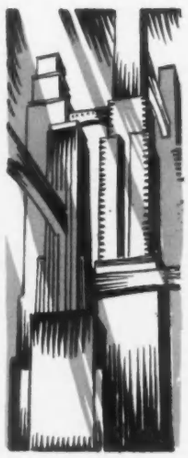
As can be judged readily, the salvage of steel equipment is large. Ninety per cent of the material is salvaged and returned in perfect condition fit for re-use. About one-half of the 10 per cent reduction is due to direct total physical loss (misplacement) of pieces and parts of the materials. This may eventually be overcome.

This industry is so new that experience is not yet established fully, but for safety and protection the amortization period has been placed at five years.

Formerly the writing-off period for the wood scaffold and towers and bridges was fixed by long experience at well under three years. Sometimes by direct loss and by damage the equipment on a job was reduced 50 per cent in one use.

A complete maintenance shop is fully equipped with inspecting, testing and reconditioning machines. All materials as returned from the job are sorted, inspected and then fully cleaned. Painted members are repainted. All bolts are removed and all threads are die cleared. All parts are then redistributed into stock.





Maintenance of Equipment

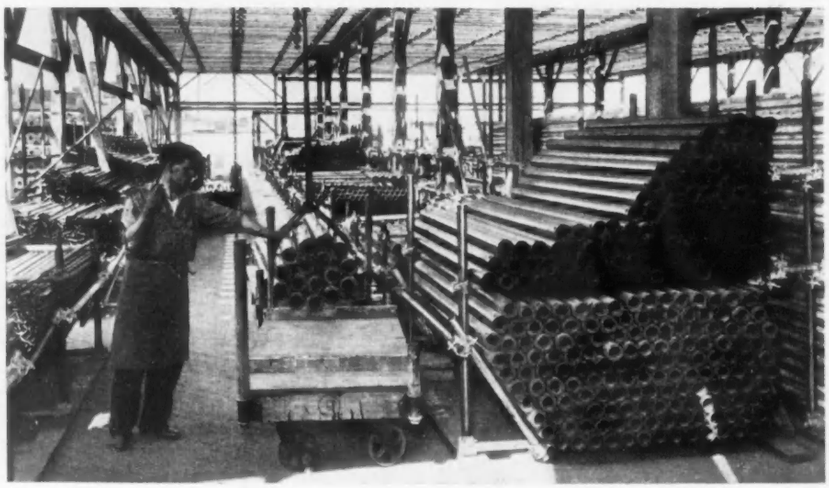
Skilled workmen are constantly employed at the same work and a low maintenance cost is secured. It is believed from experience that no general contractor could maintain his own yards and maintenance, even at twice the present costs. And again, for a single contracting firm to carry a stock complete enough to supply its own needs would mean large additional overhead, from which it is now freed. Experience of the past two years has demonstrated that 60 per cent of the equipment can be kept active on the job.

Volume of Steel Market Developed

How much steel will be required for this purpose cannot well be stated. It is so far known that many thousands of tons of steel have already been used, and the rate of use annually is growing. The industry is so new that it is not even yet known what additional demands will come upon it.

Thus far the principal field has been in supplying the larger buildings. But now the market is growing rapidly for the steel scaffoldings to replace wood in the buildings which are too low to need swing scaffoldings. This market is very large and the future must tell the story.

New demands for service arise constantly. Steel barricades, steel protections and steel in various uses to replace wood are being presented and request made for equipment. So far as possible, the already well-taxed equipment companies are responding.

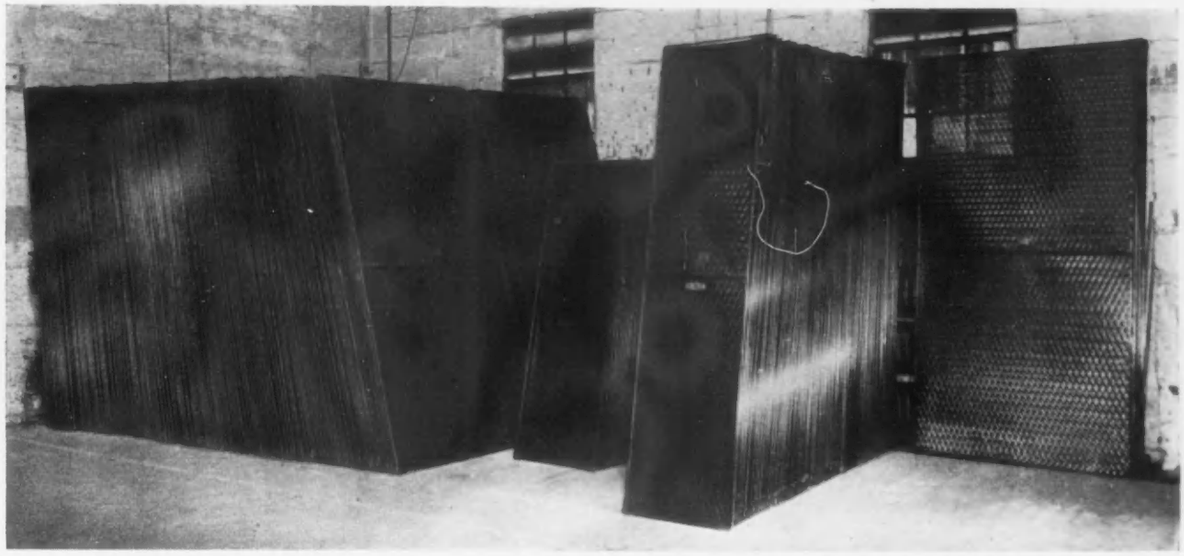


INSIDE and outdoor storage of steel for scaffolding and other contractors' use. This is in the yards of Chesbro-Whitman Co., Long Island City, N. Y., which rents the equipment to building contractors.

▼ ▼ ▼

Engineering Service Must Correspond

This has logically and necessarily developed into adequate engineering service. Four years ago this sort of service was largely just to go out and look the job over carefully, and then begin to send truckloads of timber and plank, often much of it new out of stock. Today it is a distinct engineering project of studying carefully the blueprints from the first to the fiftieth floors, and finding all the layouts feasible for location of the hoist towers.



Protective panels used around hoists or places where men are at work. These are used also in construction work, to guard against pilferage.

This is much more markedly so, since the use of the outside tower hoist is becoming so much more general. We must interpolate that certain advantages of outside towers, such as permitting completion and rental of complete floors long before final completion of the building, and other advantages of cost are increasing the number of outside tower installations. Steel towers, being safe, have contributed much and are a necessary factor to this.

One recent large job required 19 complete layouts with blueprints before the most serviceable installations could be determined by the equipment company engineers and the construction superintendent of the job.

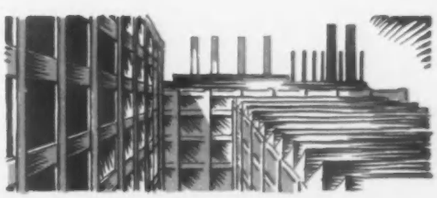
Steel scaffolding goes up far more quickly than wood. As to removal, a certain disappointed engineer was intending to accept an invitation to go up on the Empire State Building tower scaffolding on a certain Monday. But work moved fast. On Friday morning the start to remove the 101 tons of steel scaffolding began, and by Sunday it was all removed, and not a single piece of the scaffolding or a bolt or a nut was accidentally dropped to the streets below.

▲ ▲ ▲

Rubber Covering Increases Wear of Metal Parts

WITH the development of a process for making rubber adhere satisfactorily to metal, a new field was opened for the use of rubber. This matter was stressed by Charles W. Staacke, development engineer, B. F. Goodrich Co., in a paper before the American Society of Mechanical Engineers at Cleveland, on April 14. What follows is from his paper.

Chutes are being rubber lined which outwear the best steel as much as 10 to 1. As is the case in obtaining satisfactory service from any rubber product, operating conditions must be carefully studied first, and then the correct application made. Rubber has failed in some cases, not because it could not give satisfactory service, but because it was misapplied. For example, in chute linings a $\frac{3}{8}$-in. rubber thickness might be sufficient for taking care of the abrasion, but a 1-in. thickness would have to be used to take care of a severe impact condition.



It was found in ball mill service that rubber linings would not give universally satisfactory service. Where load impact is too great the rubber lining will break down, or where excessive heat is generated, due to the frictional resistance of dry materials on the rubber lining, failures may take place. But, properly applied, rubber linings allow the use of a greater ball load for the same diameter of mill.

Grinding is faster and the finished product is finer. The power required to operate the mill is less; operation is smoother, and the rubber linings outlast metal linings when proper application has been made. Rubber linings are valuable in the ceramic industry, where contamination in grinding may result from the use of metal linings.

UNEMPLOYMENT LESS SERIOUS

NEW ENGLAND has many industrial plants situated in small towns in farming districts where agriculture and manufacturing live side by side and supplement each other. In such localities the effects of unemployment or reduced hours have been much less severe than in the more congested centers, which is possibly an argument for decentralization of industry.

The experience of the Wallingford, Vt., plant of the American Fork & Hoe Co. is typical of a situation that doubtless exists in many rural communities throughout the country, but which is particularly true in New England for a variety of reasons not necessary to enter into here.

The American Fork & Hoe Co. is a fairly large organization, with a number of small plants scattered through the country. The Wallingford plant is not conducted in any sense as a social experiment. It has the same problems as to production and profits as any other plant situated in a large center.

Employees Suffer Little Hardship

"Our employees as a whole have suffered less hardship during the depression than many other groups because of their close contact with the land," said R. C. Taft, plant manager, in discussing the manner in which the American Fork & Hoe Co. and its employees at this particular location have met the present situation.

"It may not be permissible," said Mr. Taft, "to draw general conclusions from the experience of one manufacturing unit. The solution for the difficulties which all of us are facing probably is different in every case and depends to some extent on the local conditions with which each is surrounded. On the other hand, a knowledge of how some industries have met their problems undoubtedly will be helpful and suggestive to others. Our experience in Wallingford will give an idea of the advantages of a farming community as a location for a manufacturing plant under present conditions."

The Wallingford factory employs about 125 men and girls. Its products are pitchforks, hoes, spading forks, steel rakes and other agricultural and gardening hand tools. The business was started in 1825 by three brothers named Batcheller, and some years ago became a part of the American Fork & Hoe Co. merger.

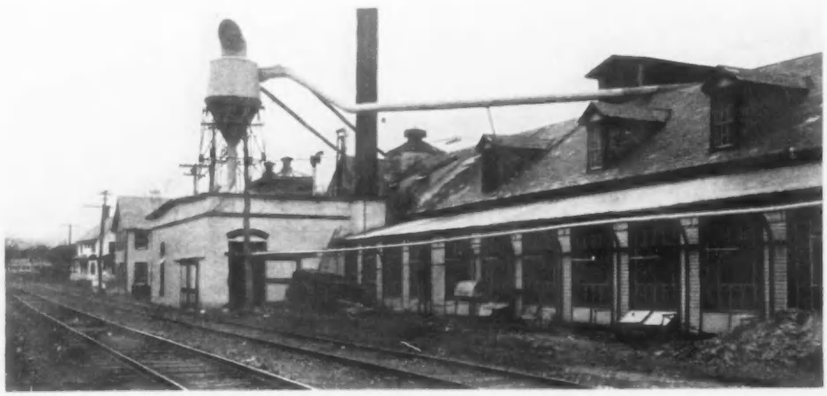
A One-Factory Town

Wallingford is a one-factory town. There are no other manufacturing plants nearer than 10 miles. The village is surrounded by farms, most of which are devoted to dairying.

This industry, having been in existence for so long a time, has become an important factor in the community. Some member of almost every family has a job there. Boys and girls who do not like farm work have found employment there, as well as a good many of the villagers. Long service has been the rule. The oldest employee has been working for 55 years, and, though now 80 years old, is still able to do good work. Twenty-five years of service is so usual that it attracts no attention. In fact, fully half of the employees have been on the job for 20 years or more.

There is a pension plan, to which all who have given 25 years of satisfactory service are eligible. There is no hard and fast retirement age. The case of each person is considered on its merits.

Fortunately, the slack period for this business comes in summer. Last summer the plant was shut down for six weeks in July and August, and the same procedure is planned for this year. As this is the time when farmers are rushed with haying and in need of extra help, many of the factory employees hire out for such work. Others have small farms of their own, and they utilize the summer slack period for their own work. On these small farms some have a cow and



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WALLINGFORD, VT., is a one-factory town. This is the plant, that of the American Fork & Hoe Co., which has met the unemployment situation more successfully than many big-town plants.

IN SMALL-TOWN PLANTS

By FRANCIS A. WESTBROOK
Consulting Engineer, New Canaan, Conn.

a pig, some keep bees and others go in for fruit raising. All of them have vegetable gardens. Even most of those who live in company houses have vegetable gardens either adjacent to their homes or on some nearby piece of land. In this way the summer shutdown is not much of a hardship.

Few Employees Have Been Dropped

During the rest of the year the plant is operating three to five days a week under current conditions. Work is rotated so that very few employees have had to be dropped. The experienced and valuable workers have been kept intact. Here again the fact that the plant is located in a rural district has a great advantage. Many of the men secure their own fuel by going into the woods with their axes. It is safe to say that something like four times the usual amount of wood has been taken from the mountain sides during the past winter.

Others who are experienced as "handy men" devote their "lay off" time to such jobs as radio repairing, painting and paper hanging, electrical wiring and so on. In a small community the various accomplishments of the citizens become well known, and it is an easy matter for them to pick up odd jobs to help out.

The situation in which these people find themselves when work is slack is vastly different from that of the city worker, who is virtually down and out when his pay envelope stops or becomes very small. With manufacturing and agriculture being carried on side by side, employment can be better stabilized. Unemployment is virtually negligible at Wallingford, because jobs were found almost immediately for those that the company found it necessary to lay off indefinitely.

"Like many others," said Mr. Taft, "when the depression first came upon us, we followed the suggestions of well-meaning but, I now think, misguided, people who said that we should go on manufacturing even if we could not sell the goods in order to avoid throwing people out of work. The idea, of course, was that the goods would eventually sell. Actually, this was a bad thing to do in an already over-produced market, for it simply delayed recovery and eventually we would have to stop producing and wait until the surplus was consumed. Consequently, during the past year we kept our production below consumption and cut our inventory in half. It is now as low as it can be, and even if we have no greater volume of orders during the coming year than during the past year, we will have to run a good many more hours. For this reason we are looking forward to the coming year with much more cheerfulness than we have felt for a long time.

Sees Future for Forecasting

"Forecasting sales as a basis for budgeting production is another very important step in the stabilization of employment that we are trying to make the most of. It is an old idea, but only recently sensed by management as an aid in eliminating or mitigating the severity of the business cycle. Obviously, it is not intelligent to produce more than can be consumed. To forecast consumption may seem extremely difficult, but to some extent, at least, it is not so impossible as it might appear. There is always last year's volume as a basis. By keeping close contact with salesmen and knowing what is going on in our own sphere of activity, it is possible to make some sort of fairly decent guess as to what the business of the coming year will be. One thing is to try not to become too enthusiastic and to look facts in the face ruthlessly even if they hurt. I personally visit enough of my trade to form an idea of how things are going, and I also go to conventions, agricultural expositions and fairs, where we have exhibits, and see the reaction of our public to additions to our line as well as to our old line. Forecasting has not yet been developed on the scientific statistical basis which its importance requires, and we feel that much more can be expected from it in the near future."

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THE American Fork & Hoe factory employs about 125 men, boys and girls in normal times. Almost every family in the village has at least one member at work there.

VITREOUS ENAMELING AND CONVEYORS

INTERLOCKING systems of conveyors, in which gravity and power floor conveyors and overhead tramrails are used, feature the layout of the Westinghouse enameling plant here described. The system of interconnection is such that little labor is required in transferring materials in process from spraying lines to the burning line and from burning oven to the next operation.

COMPACTNESS is an outstanding feature of a vitreous enameling plant recently installed by the Westinghouse Electric & Mfg. Co. at its Mansfield, Ohio, works. All the equipment is arranged for saving floor space and to reduce handling charges to a minimum. The department was equipped primarily for enameling pressed steel evaporators used in electric refrigerators, but it is used also for enameling platforms, doors and front frames for electric ranges.

Overhead conveyors handle the work, after the ground coat is dipped, through a drying oven, and on to the burning furnace. Another conveyor, which serves also for cooling and storage, takes the parts back to the starting point, whence the circuit is repeated for succeeding coats. Burning is done in a continuous conveyor-type electric furnace. The drying oven is an electric unit, also. This is located beneath the ceiling so that it does not use up any of the floor space.

Variable-speed drives are provided for all overhead conveyors as well as for the furnace conveyor, permitting the operation of the plant on any desired production schedule. Economies in handling are effected also by the use of other power-driven as well as gravity conveyors. Use of conveyors to a large extent eliminates the need of portable racks for handling work during operations.

Enameling department is inclosed with glass and steel partitions, shutting it off from other departments in the building in which it is located. This keeps out dust and helps to assure cleanliness, which is one of the essential requirements for producing good-quality enamel work. With the compact arrangement adopted, the enameling department, including the adjoining mill room, occupies a floor space only some 85 ft. long x 60 ft. wide, with an additional width of 15 ft. at one end to accommodate the end of the burning furnace.

Flexibility Served by Two Duplicate Units

THERE are two duplicate units for enameling. Work coming in at one end of the enameling room moves along to the furnace at the opposite end of the department. This furnace is located at right angles to the direction of movement of pieces through the enameling process, with the loading end near the point of last operation.

Eight standard spray booths, four in each unit, are located in two rows, back to back. All work is given three coats, a ground coat which is dipped and two finish coats which are dipped on the inside and sprayed on the outside. There are two dipping tanks in each unit, 6 ft. long and 3 ft. 4 in. wide. These are set on casters for convenience in moving them around.

Feeding from One Conveyor to Another

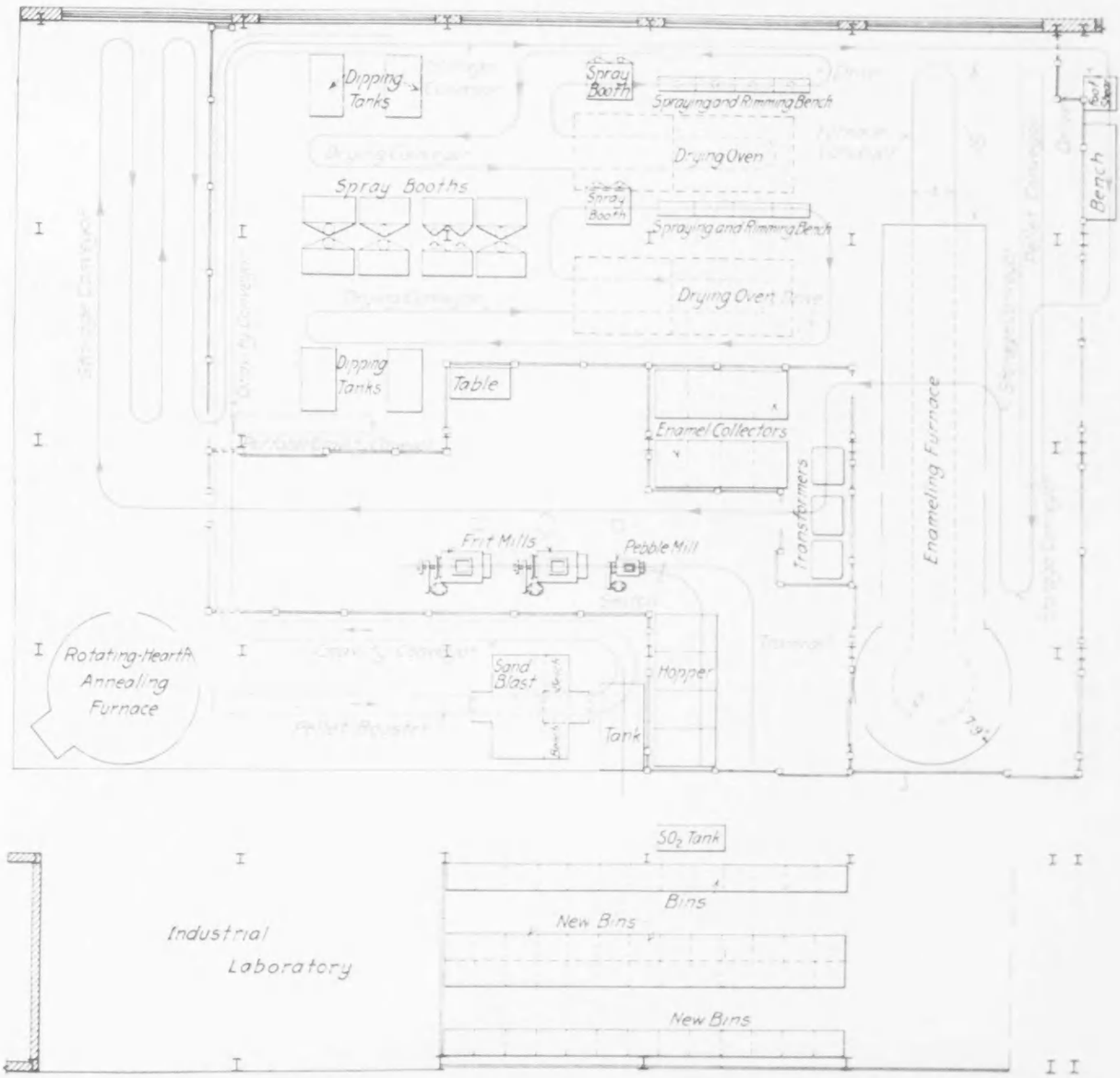
Pieces are carried by hand a few feet from an incoming gravity roller conveyor to the dipping tanks. After dipping they are hung on hooks on an overhead chain-type conveyor, on which they remain until they are ready for burning. Starting on its circuit after dipping, the work passes through the drying oven, about 15 ft. in length. Each drying oven is a 73-kw., 220-volt unit, a temperature of 350 deg. F. being maintained.

Looping back out of the dryer the evaporators pass through a booth in which the edge is sprayed

BURNING ON

UNDER DEFINITE CONTROL

with black enamel while the piece is moving on the conveyor. This booth is of special design with a slot across the top through which the conveyor moves. One burning operation is saved by spraying the edge before the first burning. From this spraying booth the work goes over a rimming bench and the enamel is brushed off the threads of the studs projecting from the bottom of the evaporator. This



Enameling plant has an inter-connected conveyor system. Work from the sand-blast room (bottom) passes up at left to dipping, thence to drying, spraying and burning (at right), and then around again for next coat

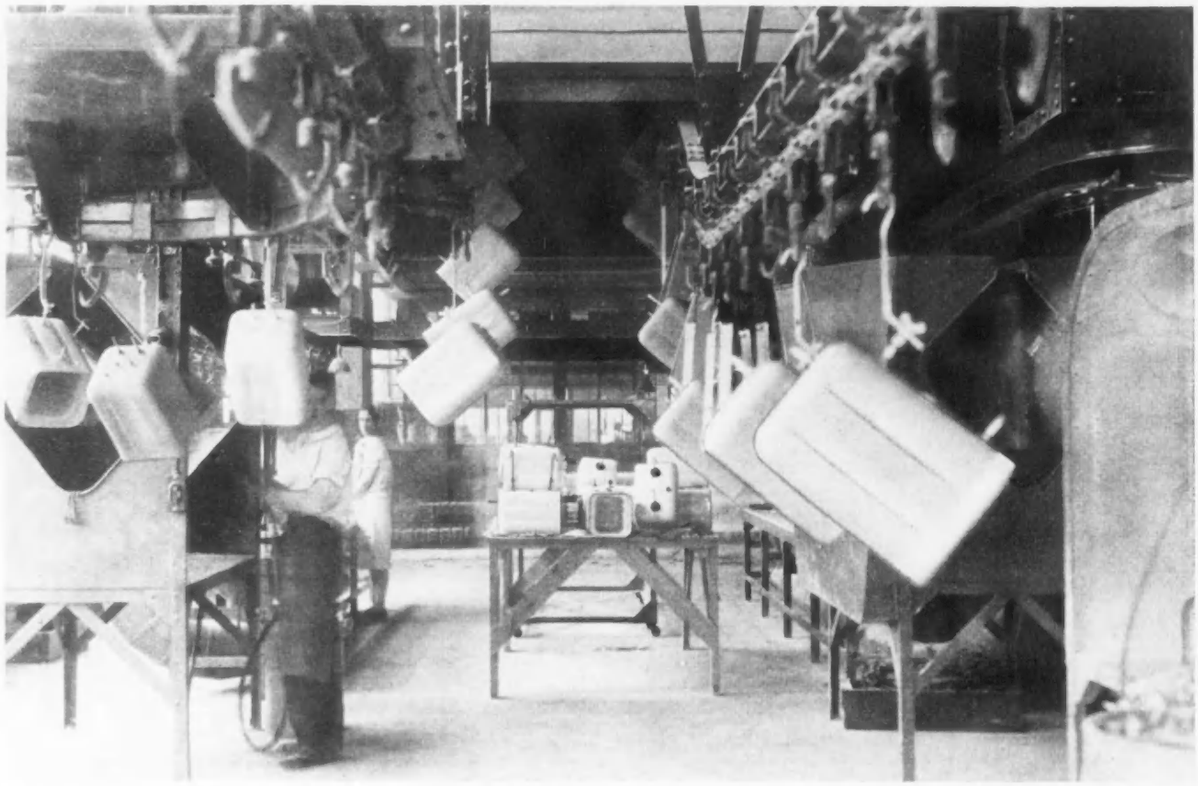
is done while the piece is moving. The next step is the replacing of one conveyor hook, used up to this point, with two heat-resisting hooks of nichrome steel. This also is done without taking the work from the moving conveyor.

A little further on the conveyor makes a loop. At that point the pieces are lifted off and placed on the furnace conveyor. Looping through the furnace, the pieces come out at the loading end and are set on a wooden platform conveyor operated intermittently with push button control. This conveyor is in parallel line with the furnace and along the side partition of the enameling department. Pieces are inspected on this conveyor and the dual hooks are replaced with the single hook used during the dipping and spraying operations. Before re-use these hooks are washed to remove the enamel they have picked up.

Then the pieces are hung on the overhead storage and cooling conveyor, which extends directly above the wooden platform conveyor. This overhead conveyor leaving the enameling department passes through the adjoining mill room and makes a series of loops, finally returning to the enameling department directly above the conveyor on which the pieces were originally delivered from the sand blast. This conveyor is 600 ft. long and has 400 hooks on 18-in. centers. At its maximum speed it takes 25 min. for the conveyor to make a circuit.

From the storage conveyor the pieces are placed back on the drier conveyor and move again down through the enameling room, with the spray booths on one side and the dipping tanks on the other. The pieces are taken off the conveyor, dipped on the inside and sprayed on the outside. Then they are placed back on the conveyor and the movement previously outlined through the drying oven and burning furnace and to the cooling and storage conveyor is repeated.

After the second finish coat the pieces go from the inspection conveyor to the stockroom. The only difference in the procedure as compared with the application of the ground coat is that spraying of the edge in the black enamel booth is not repeated. Instead, the freshly applied white enamel is wiped off the edge to allow the previously sprayed black edge to show through.



Conveyor is here entering elevated drying oven. Work passes on the same conveyor, after drying, through slotted spray booth at left, in which the edges of the pieces are sprayed while moving. Pieces shown are evaporators for electric refrigerators.

Hooks used in carrying work on the enameling conveyors are of a special swivel type, which allows the pieces to be swung around as desired, but also prevents them from moving with the force of the spray. Fixtures and hangers to fit the work are used in the spray booths. Enamel is supplied to the spray guns from pressure tanks of 30 gal. capacity.

Heat Interchange Saves Current in Burning

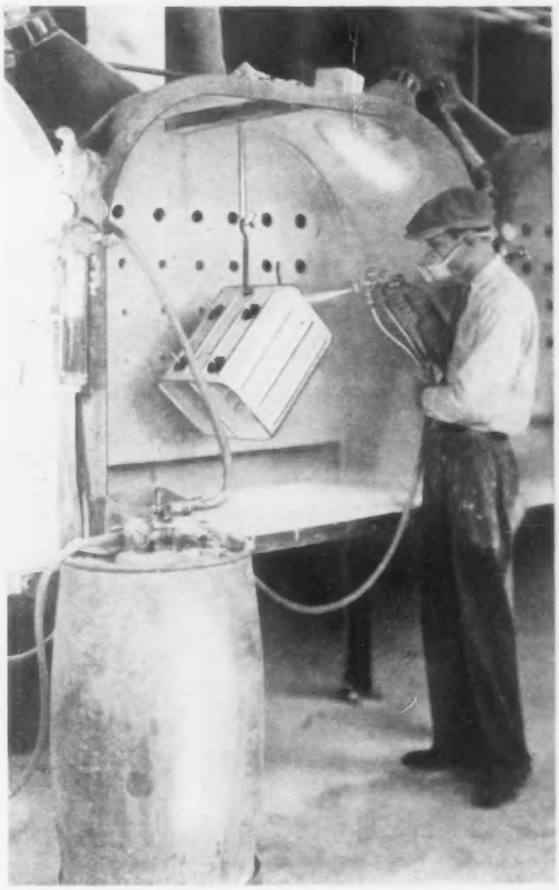
ONE burning furnace, about 45 ft. in length, is used. It is a 200-volt, 3-phase unit of 440 kw. capacity. The heating chamber, 20 ft. long, is in the form of a horseshoe at the rear end, which is inclosed,

and raised a few feet above the entrance, providing a heat seal. The front part of the furnace chamber (designated as the heat-exchange zone) is divided by a brick wall in which open arches, at frequent intervals, permit heat to pass from the outgoing work to the incoming chamber, where it is absorbed by the cold work entering the furnace. The conveyor extends about 15 ft. back from the furnace entrance, where it makes a loop and provides ample loading space.

The firing chamber is divided into four zones in which nearly the same temperature is maintained, although the first zone is held at a slightly higher temperature than the other three because of the cooling effect from the work as it enters the first zone. Each zone is individually and automatically controlled by a pyrometer and each has a temperature recorder. Heat in any zone may be entirely cut off by a push button.

In addition to these controls there is at the front of the furnace a temperature indicating instrument with a dial to register the temperature of the four zones. This permits the operator to make a check on the furnace temperature without consulting the recording instruments, mentioned above, located at the side of the furnace near the firing zone. The control and recording instruments were supplied by the Brown Instrument Co.

Current is brought in on 2300-volt lines to the side of the furnace, where it is passed through a battery of three 150-kva. transformers. Thus the secondary circuit from the transformers to the furnace is shortened and consequently the power loss in the lines is reduced.



Spraying the outside of an evaporator in one of the spray booths.

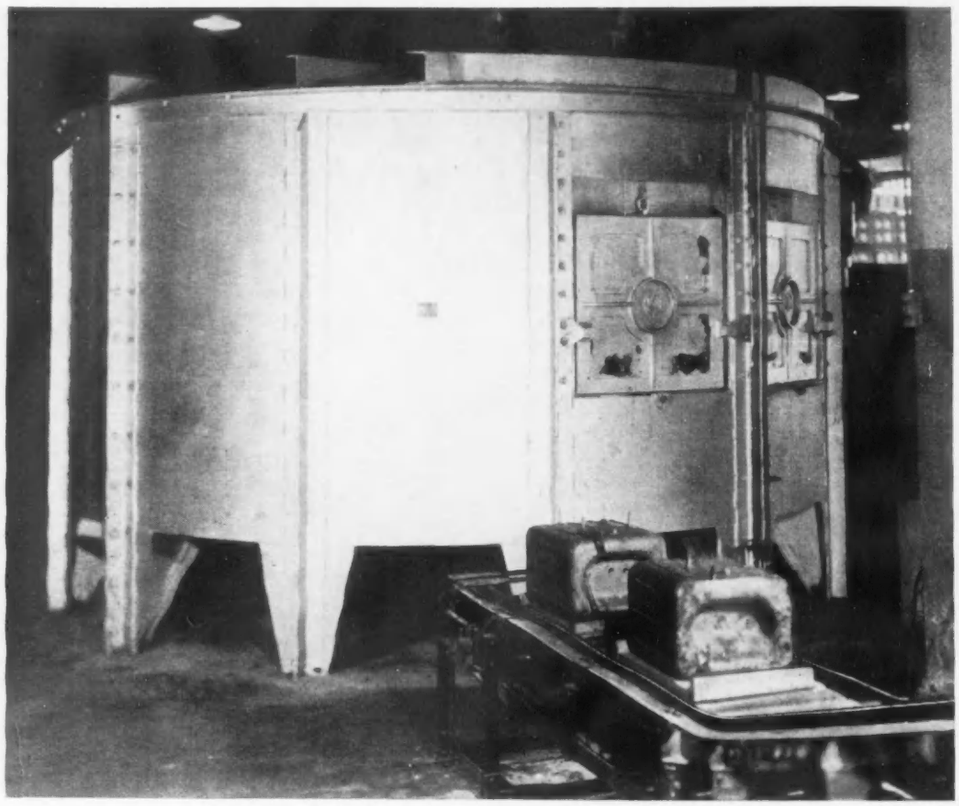
One of the dipping tanks.

Temperatures and Timing Under Close Control

Usually the ground coat is burned at 1600 deg. F., the first finish coat at 1560 deg. and the second finish coat at 1540 deg. Speed of operation depends on the character of the work, pieces being kept in the furnace from 40 min. to 3 hr. A time cycle of 7 min. 30 sec. in the firing zone is followed in burning evaporator shells. Cast iron doors and fronts for electric ranges are kept in the firing zone from 20 to 30 min. Because of the longer time required for this work and to prevent interference with steady production on refrigerator shells, the stove castings are burned at night.

Enamel dust is drawn from the spray booths by a suction system through pipes connected with the tops of the booths and is carried through a system of ducts to two enamel collectors in an adjoining room. The air is washed and the fan delivers it back into the room through an overhead duct having openings at intervals. With this re-circulating system the amount of clean air returned to the room is the same in volume as the air drawn out.

At the side of the enameling room, in a section of the glass-inclosed enameling department, is the grinding room, separated from the enameling room by a



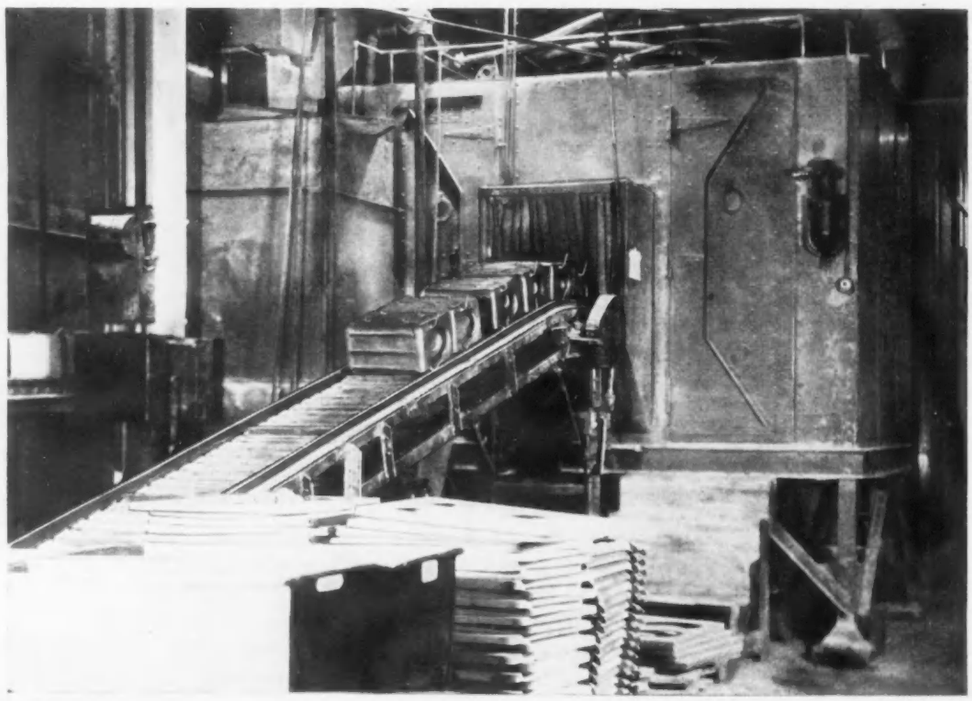
ROTARY-HEARTH electric furnace is for annealing. The conveyor carries the work from the furnace to the sand-blast cabinet.

partition. Scrap enamel scraped from the booths is here remilled and used for the first white coat.

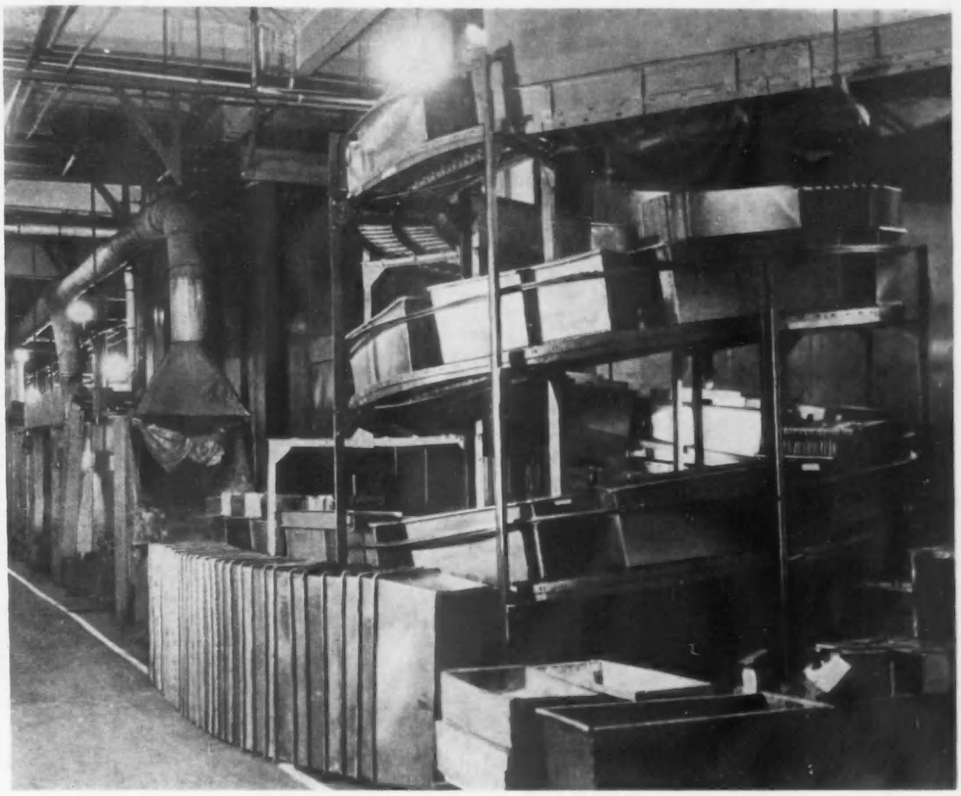
Annealing Required for Some Products

Evaporator shells for refrigerators are annealed to take out the strains and thus avoid danger of the enamel crazing, after which they are sand-blasted. While pickling is regarded as a cheaper cleaning process, sand-blasting is considered more satisfactory for cleaning the evaporators. All range castings are sand-blasted, also.

For annealing, an automatic rotary-hearth electric furnace — a 200-kw., 220-volt, 3-phase unit — is provided. This furnace is supplemented by two 24-kw. box-type furnaces, used when production is materially curtailed, so that the operation of the large furnace



BOOSTER conveyor from rotary-hearth furnace delivers pieces to entrance of sand-blast room, so that it is not necessary for sand-blast operators to leave their room. The conveyor has push-button control.

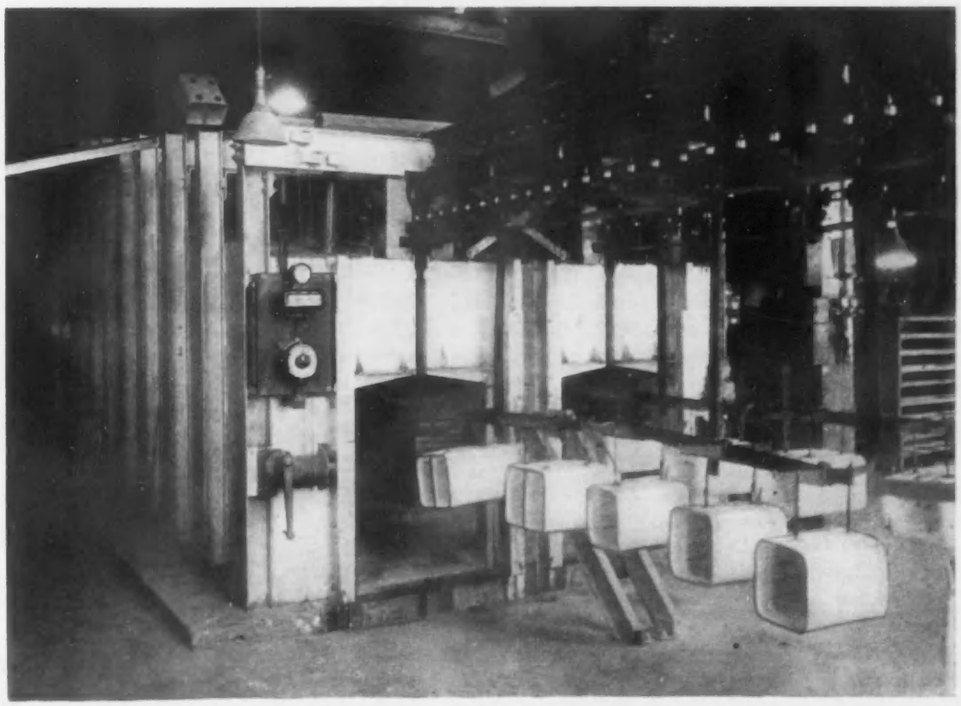


WORK to be washed before japanning is handled in tote boxes. It is delivered to the spiral conveyor that serves as temporary storage in front of the washing machine.

is not warranted. Work is kept in the annealing furnace 7½ min. at 1600 deg. F.

Leading from the discharge side of the rotary annealing furnace to the entrance of the sand-blast room is an inclined booster conveyor about 30 ft. long. This feeds work into the sand-blast room. When the sand-blast operators need additional pieces they start the conveyor with a push button and move it forward a few feet, bringing additional pieces within their reach at the entrance of their room.

After sand-blasting, the pieces are placed on a gravity conveyor at the opposite side of the sand-blast cabinet and passed on to the enameling room. With the conveyor arrangement, handling of pieces by the sand-blast operators is reduced to a minimum, as they are not required to leave the cabinet to obtain or to



BURNING furnace is a continuous electric type and the conveyor and method of handling work are special. Heat seal under conveyor chain protects lubrication and conserves furnace current. Dial at furnace front is for checking furnace temperature.

take away pieces. When the annealing is done in the box-type furnaces the pieces are trucked to the conveyor that feeds the sand blast. The sand-blast equipment is a standard Pangborn unit.

Metal Tote Boxes for Small Stampings

A convenient method is provided for handling and storing small stampings, most of which are used in the manufacture of electric stoves. These are loaded in sheet metal tote boxes about 36 in. long, 18 in. wide and 20 in. deep, flaring out slightly at the top. The parts are placed in these boxes after the final stamping operations and the boxes move on roller conveyors to a series of metal storage racks at the side of the stamping department. These racks, six tiers high, extend to the ceiling.

In every aisle between two rows of racks is an electric hoist mounted on a truck that runs on a track in the center of the aisle. A loaded tote box is raised by the elevator, which is operated by a push-button control, to the level of the tier in which it is to be stored, and the box is pushed off on to the storage rack. The operation is reversed in taking the tote boxes from storage. The parts stay on the storage racks until they are to go to the japanning or enameling departments.

Tote boxes containing the small stampings and stove platforms to be japanned are placed on a roller conveyor connecting with a booster section that carries them near the ceiling. From here the boxes move by gravity to a spiral conveyor feeding into a Blakeslee washing machine. The spiral conveyor serves as a storage space for work to be cleaned in the washing machine. The pieces are lifted by hand from the tote boxes on to the conveyor of the washing machine and the empty tote boxes are stacked on the floor to be taken back to the stamping department. The parts, after cleaning, go to an upper floor for japanning. All parts to be japanned go through the washing machine before the coating is applied.

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Determining Standard Skid Dimensions

ONE of the great difficulties encountered in setting standard dimensions for skids was that of coordinating the requirements for shipping with those for inside-plant handling. This subject was discussed at length by R. L. Lockwood before the American Society of Mechanical Engineers, at Cleveland, on April 15.

Throughout the entire field of transportation, there was only a single dimension which could be considered as a recognized national standard. That dimension was the inside width of a railroad box car, 8 ft. 6 in. Some 67 per cent of box cars in freight service are of this width, and 24 per cent are slightly wider.

Since by far the largest percentage of skid shipments was expected to travel by rail, it was essential to select dimensions which would permit proper and economical stowage in box cars. In all current practice, ever since skid shipments began, skids have been loaded lengthwise in cars wherever possible, and placed either two abreast or three abreast. This definitely limited the skids to theoretical widths of 51 in. and 34 in., respectively, and actual widths to not more than 50 and 33 in.

A skid 50 in. wide, as first suggested, was approved by very few users, the objections being numerous and valid. It was too wide for doors, aisles and passages. If its length were in the usual ratio to its width, it would be hard to handle on sharp turns, and its economical load capacity too large for quick and convenient handling. It would not stow economically on a motor truck. It would be unduly heavy and expensive.

After full and careful study of these and many other factors, the 42-in. width was recommended, for the following principal reasons: adequate clearance in a box car for skids placed two abreast; sufficient margin to provide for overhanging loads and for rapid stowage and removal; stowage of skids two abreast (with no overhanging load) in highway transport vehicles or interurban freight cars; clearance through doorways, aisles and passages of ordinary width.

The length of the freight skid, first set at 66 in. was later reduced to 60 in., for two principal reasons: the first was economical stowage in box cars. About 41 per cent of such cars are 36 ft. long inside; 52 per cent are over 36 ft. and not over 40 ft. 6 in. long. Only 5.5 per cent are less than 36 ft., and 1.5 per cent are more than 40 ft. 6 in.

Fourteen skids placed end to end, in two rows of seven each, can be stowed compactly in a 36-ft. car. If a car is more than 40 ft. long another skid can be stowed crosswise opposite the door, provided the door is wide enough.

The second controlling factor in selecting length was convenience in handling on sharp turns, where a 66-in. skid is a little too long for many plants and storehouses. Still another factor was minimum overhang beyond the platform of lift trucks, particularly those operated by hand. Considering length and width together, the gross area of the freight skid is 17½ sq. ft., and usable area about 16 sq. ft., allowing for space occupied by end racks.

At about 300 lb. to the square foot, this skid will easily carry a total load of 5000 lb. Fourteen skids with normal load will carry double the required minimum car-load for almost any commodity. At the same time, the freight skid with normal load, or even with a considerable overload, can be handled quickly and conveniently by any lift truck of proper capacity.

Light, Power and Heat. Down into the forging ingot mold goes the incandescent lamp, enabling the mold inspector to pass upon its condition. From mold to mold he swings with the aid of the accommodating overhead crane. Later on, the same crane will serve these molds with molten steel.

An etching, on glass, from original drawing made at Midvale Co., Nicetown, Pa.

INTERACTION BETWEEN INGOTS AND INGOT MOLDS

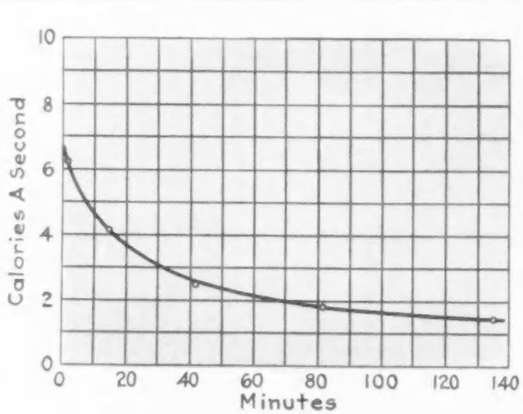
TEMPERATURE relations between ingot molds and the ingots cast into them (at the rate of 14,000 tons an hour, the world over) were discussed in a paper read by Dr. Andrew McCance before the West of Scotland Iron and Steel Institute. What follows is an abstract of portions of the paper.

Quick Formation of Skin

On filling the ingot mold a very thin layer of steel instantly solidifies in contact with the mold surface, both coming to a common temperature. Heat flows from the liquid steel through this initial layer or ingot skin, and is absorbed by the mold, heating it up. If no air gap forms, the temperature of the surface of the ingot remains constant until the solidification of the liquid steel has ceased and the whole system starts to cool down.

If an air gap forms, however, then the surface of the ingot, instead of remaining constant, will actually rise. It follows that the dimensions of the ingot will also remain constant, or in the latter case a slight expansion will take place when the surface temperature rises.

After solidification is complete the ingot and its mold will both cool down and will contract. The dimensions of the ingot in the cold state will be less than those of the mold by an amount equal to the total contraction of the steel, from a temperature which will be somewhere between the initial skin temperature and the freezing temperature, to the ordinary temperature of the surroundings.



Rate of heat absorption from ingot to mold drops consistently as time passes.

Cooling Effect of the Ingot Mold

This view of the practical constancy of the ingot skin and of the inner mold surface, though not strictly true, is sufficiently true to enable us to simplify considerably our conceptions of the heat flow between ingot and mold.

The rate of heat absorption is very rapid during the first few seconds; it falls off quickly, then more slowly to a steady rate. In the initial stages—that is, the time corresponding to the formation of the ingot skin—it is rather startling to find that the thickness of the mold has not the slightest effect. The rate of heat absorption is independent of the wall thickness, and a thin mold cools the ingot just as quickly as a thick one. It is only after the lapse of some time that a thin mold dissipates heat faster than a thick one—so long a time, in fact, that it is without any influence on the ingot structure.

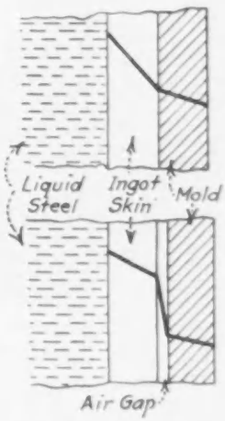
If we turn for a moment to consider the crystalline structure of the ingot section, and try to correlate it with the rate of heat abstraction, there are three distinct types of crystal growth which must be accounted for. A section of a stainless steel ingot, taken from the extreme top portion, showed on the outer skin a layer averaging 3 mm. thick, of very fine, uniform crystals. This is followed by pronounced columnar crystals varying from 18 to 25 mm. Finally, there is the central portion of equiaxed crystals which make up the remainder.

Most Rapid Heat Exchange in First Period

It is probable that the first layer is formed when the steel and the mold surface are in close contact—a period which exists for the first few seconds and corresponds to the most rapid heat exchange. As the air gap between the ingot and the mold widens, the second period is passed, resulting in the formation of columnar crystals. The rate of heat exchange appears to fall within the values of about 15 to 4 calories a second, while the whole period lasts for about 5 min. from the commencement of teeming.

This time period is influenced, however, by the thickness of the mold, and the author is of the opinion that the formation of columnar crystals seems to be much affected by the silicon content of the steel.

HEAT interchange between ingot and mold changes consistently as the one solidifies and the other, by increasing temperature, approaches equilibrium in heat flow. As the air gap forms between mold wall and the contracting skin of the solidifying ingot a change takes place in the interchange of heat, somewhat as depicted at right. Slow teeming of the steel is found to be beneficial in reducing the stresses acting between ingot and mold and in various other ways their interaction can, within certain limits, be controlled.



Change in character of the temperature gradient as the air gap forms.

Finally, the last stage is brought about, when the rate of heat abstraction falls below about 4 calories per second, the crystals formed now being equiaxed. It has been suggested by Brearley that equiaxed crystals are free crystals—they occur independently of the ingot skin in the body of the liquid steel—but the author has never been able to find any evidence to favor this view.

Avoid Surface Cracks by Slow Teeming

It is a fact well known in all steel works that slow teeming minimizes the surface cracking of ingots. Not only do the molds expand outward; they also expand longitudinally. And in the early stages of teeming the newly formed ingot skin is adhering to the mold wall and they are both at the same temperature. The ingot skin remains constant in dimensions, but the mold surface is expanding, and if the skin is too weak to resist the stretching it may break.

Slow teeming, by heating the inner surface of the mold and by enabling a thicker ingot skin to be formed, will reduce such stresses between them, while thick mold walls by their slower rate of expansion will be equally beneficial. Once the ingot and mold have separated, of course, these actions no longer take place. But too early separation will cause skin bleeding and bad surfaces on the ingot.

Interaction of the mold and the ingot can now be pictured clearly during the initial stages of teeming. At first both are closely in contact, but the rapid expansion of the mold results in the formation of an air gap, which in turn causes a drop in the mold inner surface temperature and raises that of the ingot skin. The time reported for this separation will depend on the accuracy of the means taken to measure.

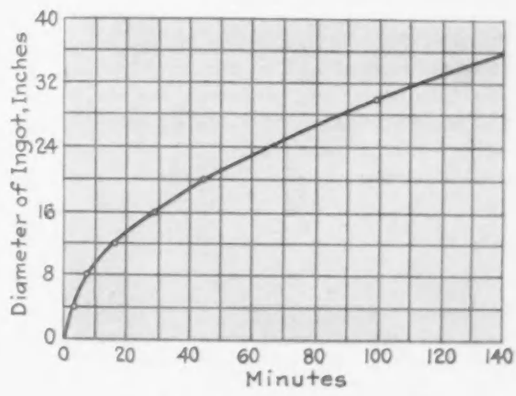
In a circular ingot 240 mm. diameter and a mold wall of 80 mm. it is of the order of 32 sec. for a gap of 0.25 mm. and 170 sec. for a gap of 0.5 mm. The reason these dimensions have been chosen is that they can be compared with the results of an interesting research by Matuschka, who measured electrically the times of separation of circular ingots of these dimensions.

Mold Wash Helps Both Ingot and Mold

A surface dressing on the mold will interpose between the ingot skin and the mold face a badly conducting layer which, by reducing the surface temperature of the mold, will prolong its life. It will also be beneficial to the ingot surface, by preventing close contact at beginning of teeming, and thus tend to prevent surface cracking.

Whether the destructive action of hot steel on the mold is due to growth, to carbide decomposition or merely to the stresses caused by fluctuating temperature conditions, is not clear. But it is certainly determined in cast iron by the time the mold has been exposed to temperatures above 600 deg. C.

One might almost suggest, in fact, that the total number of hours which any particular composition of iron can stand above this temperature is constant; and that this time divided by the time for one cast would represent the mold life.



Time of solidification of ingots increases markedly with larger and larger cross sections.

NON-DESTRUCTIVE TESTS BY THE MAGNETIC DUST

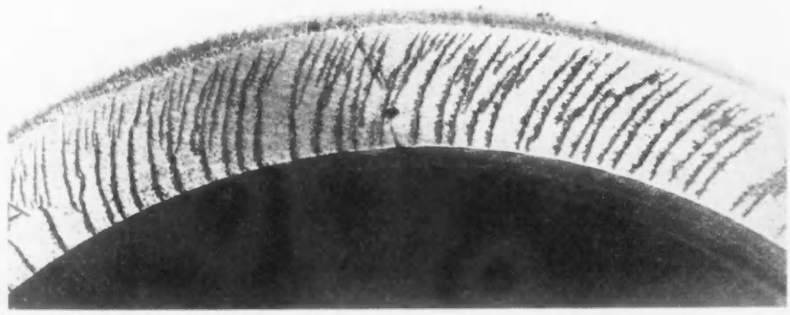
MAGNETIZED iron filings have been used to detect cracks in ground surfaces, fatigue cracks in forgings and defects in seamless tubing. Such hunting of defects in welded and other forms of steel was discussed at a recent joint meeting of the New York members of the American Society for Steel Treating and of the American Welding Society and Dr. deForest covers the subject also in this brief article.

A TYPE of non-destructive test, which up to date has been little appreciated, depends on the phenomena that finely divided iron dust will cling to the edges of magnetized cracks. This effect was fully described by Major William E. Hoke in the course of his development of the well known Hoke gage. In the course of the lapping operation with a magnetic chuck he found that steel, having surface cracks too small and too tightly closed to admit oil, were indicated by the tendency of finely divided iron floating in oil to accumulate at the cracks. Major Hoke later patented the testing of steel in this manner but did not push the matter further into other fields.

The use of this method has since been developed for hunting defects in welds, and was described for this purpose by Roux in *Welding Engineer*, February, 1930. T. R. Watts, of the Westinghouse Research Laboratory, has since investigated with much care the possibilities of this method and presented his results before the American Welding Society in September, 1930, and again delivered a paper in Pittsburgh on March 18 before the American Society for Testing Materials. His results show in general very good correlation with X-ray and mechanical tests in the case of butt welds in material below ¾ in. in thickness. For welds in thin material such as sheet up to ⅛ in. in thickness, the method is very simple and gives excellent results.

In a study made of seams in seamless tubing, it became evident that this system of inspection would be very useful in many cases, provided the proper method of magnetization and application of the test dust was applied. The proper magnetization may be either permanent or temporary magnetization by alternating current. In some cases a yoke method is desirable and in others circular magnetization is used, the requirement being that only the cracks themselves shall show polarity and thus attract the indicating powder.

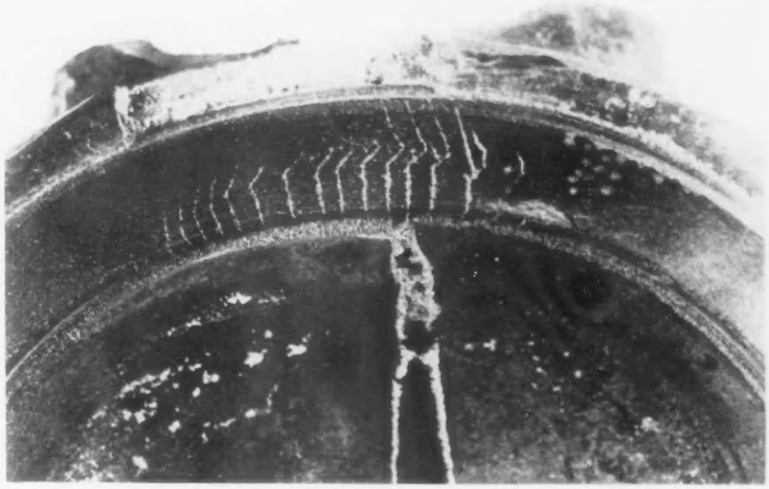
The iron dust itself was studied and an improved form developed with the name of Magnaflux powder, in which the composition, the shape of the ultimate particles, and the coating of these particles was studied. The method is in use for the detection of longitudinal seams in hot-rolled and cold-rolled rod, and seams, laps, and other defects in seamless tubing and wire. In heat-treated products the method is especially successful where quenching cracks may follow defects in the steel or may be caused by im-



Grinding cracks brought out by the dust method of magnetic testing. Magnified 2 X.

METHOD

By DR. A. V. deFOREST
Magnetic Physicist
Welding Engineering & Research Corpn.
New York



Cracks in a strained nitrided case detected by the use of iron filings in a magnetized field. Magnified 1 X.

proper quenching conditions. Forging cracks or fire cracks come under the same category and are very easily located with the proper magnetization.

In the case of ground surfaces there is always a possibility of some unforeseen accident causing grinding cracks. As is well known some steels are far more susceptible to this condition than others, and a persistent investigation of material, ground in the hardened state, shows that grinding cracks are more prevalent than is usually supposed. The Magnaflux method will show these cracks when they are too minute for customary detection. These minute cracks are exceedingly undesirable in cases where the product is under fatigue loads, particularly in ball and roller bearings.

Another interesting use of this method is in the examination of used parts for fatigue cracks. In certain important forgings, fatigue cracks have been detected below a cadmium plated surface. They were therefore hidden from the most careful inspection. In case of periodic examination a rapid test can be made to take the place of very careful visual inspection. This inspection is only a measure of actual discontinuity at the surface or below it and of course tells nothing in regard to the state of heat treatment or structure of the part.

The older methods of magnetic analysis, several of which have been described by members of the committee on magnetic analysis of the American Society for Testing Materials, are fairly well known by those who have followed the literature. This type of test is particularly well suited for indicating hardness, grain size, perfection of heat treatment and state of internal stress. It is less well suited to measurements of high localized areas such as occasioned by cracks and seams.

The two methods, however, complement each other thoroughly and it is now quite as possible to guarantee the perfection of a piece of steel from the standpoint of quality as it is to measure its dimensions to 0.001 in. Rapid and accurate methods of measurement have long had their place in the inspection department. For those who wish a similar accurate measurement of the quality of their product, magnetic measurements are available.

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Trucks for Easy Handling of Insulated Cable

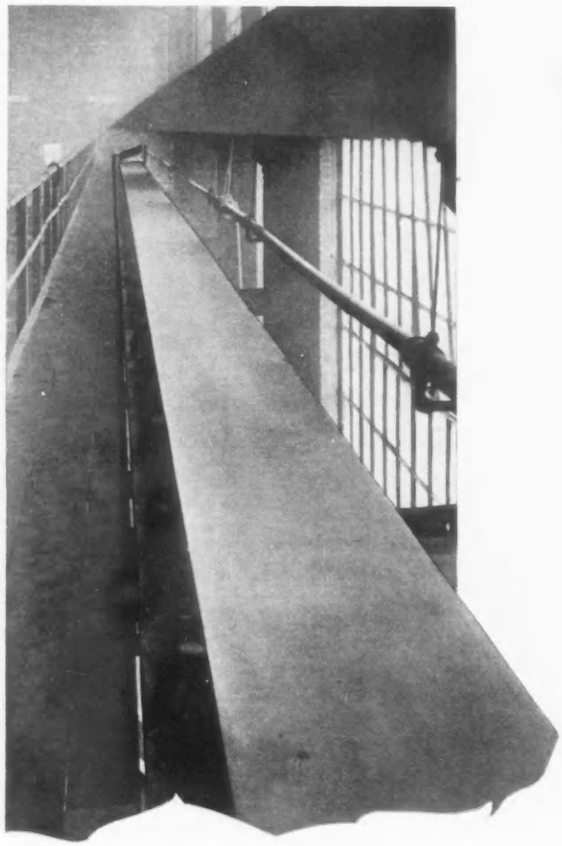
SOMEWHAT unusual, from the point of view of flexibility, are some cable-handling trucks used by the Western Electric Co. at its new Point Breeze (Baltimore) plant. These were briefly described in a paper by J. C. Hanley, superintendent of plant engineering for the company, which he read at Cleveland, April 14, at a session of the American Society of Mechanical Engineers. What follows is from his paper.

As the cable core emerges from a stranding machine it is wound on a vertical steel drum mounted on a base equipped with wheels to form a cable-core truck. These trucks are moved about by means of special electric lift trucks or picked up by an overhead bridge crane. The top of the core truck is designed with a recess which engages a grappling device suspended from the crane hook, enabling the crane operator to pick up or deposit a core truck without the aid of a ground man.

When the number of cables requiring similar drying treatment has accumulated, the overhead crane removes the loaded trucks from storage to a concentration area. Here electric lift trucks pick them up and deliver them to vacuum driers, which are horizontal welded steel-plate cylinders approximately 8 ft. in diameter and 40 ft. long, equipped with steam coils for raising the temperature.

Each vacuum drier will accommodate eight or ten loaded trucks. The cables are removed from the driers by means of electric trucks of the same type as are used for loading, and the loaded cable trucks are stored in the inclosure pending the succeeding operation.

SAND HANDLING



ALONG this gallery, over the molding machines, runs the horizontal distribution belt which carries sand to the individual molding stations.

IN the modern steel foundry, the handling of sand may be said to be the controlling element in production. In this plant of the Canadian Steel Foundries, Ltd., for example, from 500 to 1000 tons of sand must be handled daily to secure an output of from 100 to 200 tons of steel castings a day.

The installation of modern sand-handling equipment in this steel foundry resulted in quadrupling the number of molds per day, as well as reducing the cost and securing more uniform and cleaner castings.

ECONOMICAL handling of sand is one of the greatest problems of the steel foundry. The weight of sand handled for each ton of castings produced in a department specializing in railroad work—bolsters, side-frames, etc., is approximately 5 tons, and, when the plant has a daily output of from 100 to 200 tons of finished castings, the sand handling, particularly through reclaiming, cleaning and milling processes, becomes an important consideration in foundry operation.

An interesting solution of this problem has been worked out by the Canadian Steel Foundries, Ltd., Montreal, the largest steel foundry in Canada. An important part of this company's business is the production of railroad castings required in locomotive and car construction, track work, etc., which department occupies one entire bay, 800 ft. long.

The company's engineers had devoted considerable study to the sand-handling requirements of this bay with the objective not only of reducing the amount of hand labor required, but also of arranging a system which would permit considerable flexibility in the blending of the various grades of sand used. As a result, the company recently installed in this department two sand-handling units which were supplied by the C. O. Bartlett & Snow Co., Cleveland.

One unit, which is used exclusively for the side-frame and bolster floor, has a capacity of 80 tons of backing sand and 12 tons of facing sand an hour, and the second plant serving the coupler floor has a rated capacity of 60 tons of backing sand and 12 tons of facing sand. With a few minor differences, both plants are alike, which facilitates maintenance and replacement.

Advantages of Duplicate System

The advantage of having these duplicate systems is apparent. They enable each department to have thorough control over its own sand conditions, and each unit has sufficient overload capacity to serve the entire aisle for an hour or more, so that the breakdown of one of the systems does not tie up the work in the section served.

The sand storage bins, elevators and much of the sand-handling machinery have been installed in a vacant space at the side of the building, so that they do not encroach to any great extent on the foundry floor. They have been enclosed in a corrugated steel housing, which is heated in the winter months. Both units are served by a railroad siding constructed down the side of the building, which is used for bringing in the new sand and for transferring sand to other departments.

All new and reclaimed sand for stock passes

AT CANADIAN STEEL FOUNDRIES, Ltd.

By DUNCAN MACINNES

through a rotary dryer in the yard, having a capacity of 8 tons an hour, which reduces the moisture content down to 1 per cent or less.

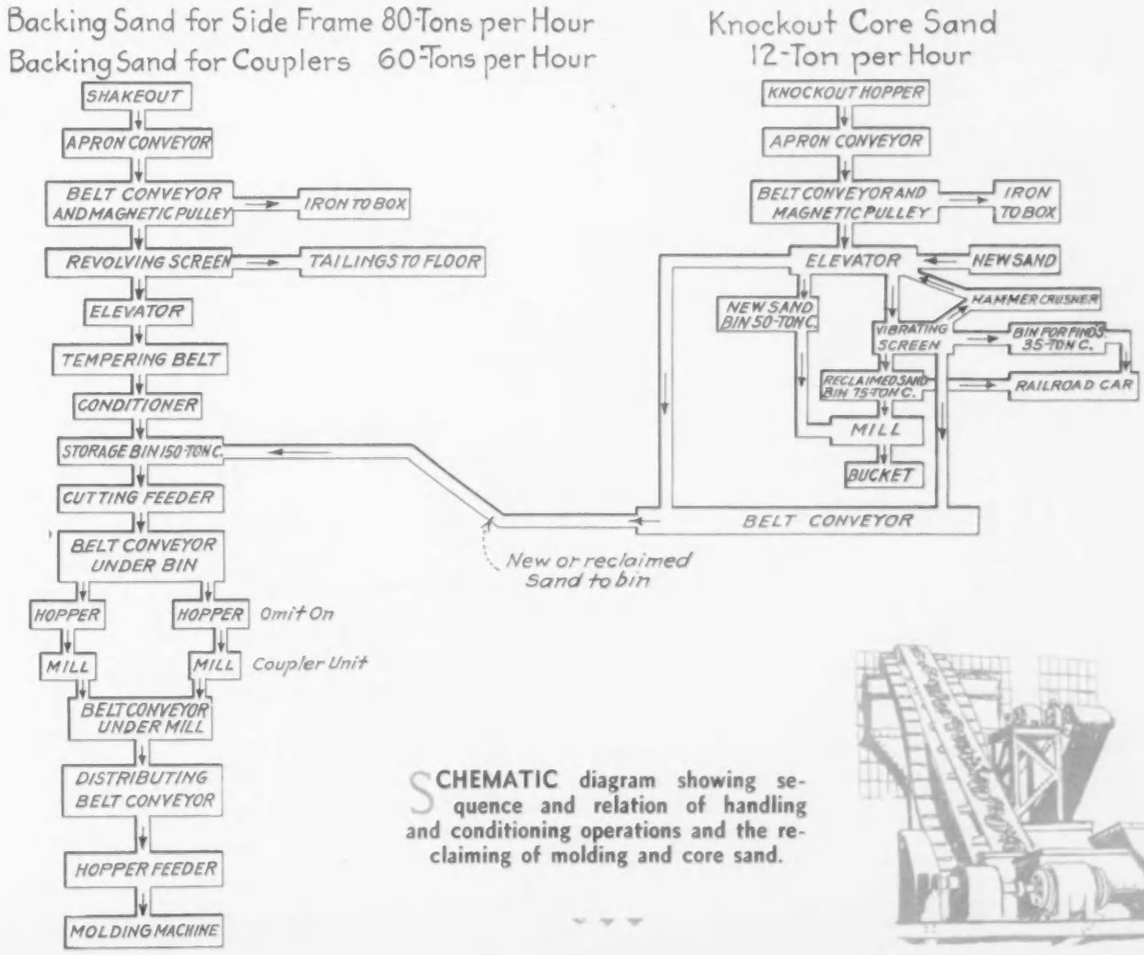
Each unit is equipped with four steel bins, having the following capacities: backing sand, 150 tons; reclaimed sand, 75 tons; new sand, 50 tons, and fines or waste, 35 tons.

The larger of the two units, that serving the bolster and side frame floor, will be described in this article.

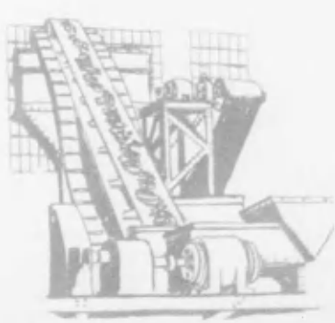
After a heat has been poured, the flasks are carried over to a grating 12 ft. by 20 ft. set flush with the floor, where the castings are removed. The sand is then vibrated out of the flasks and falls through the grating into a large hopper, from which it is picked up by a slow-moving apron conveyor. This discharges it on to a rubber-faced upwardly-inclined belt conveyor, at the top of which is a magnetic pulley to remove the steel from the sand. The sand is discharged into a rotary screen, but the gaggers, nails, etc., are carried around on the pulley and dumped into a refuse box beneath the conveyor.

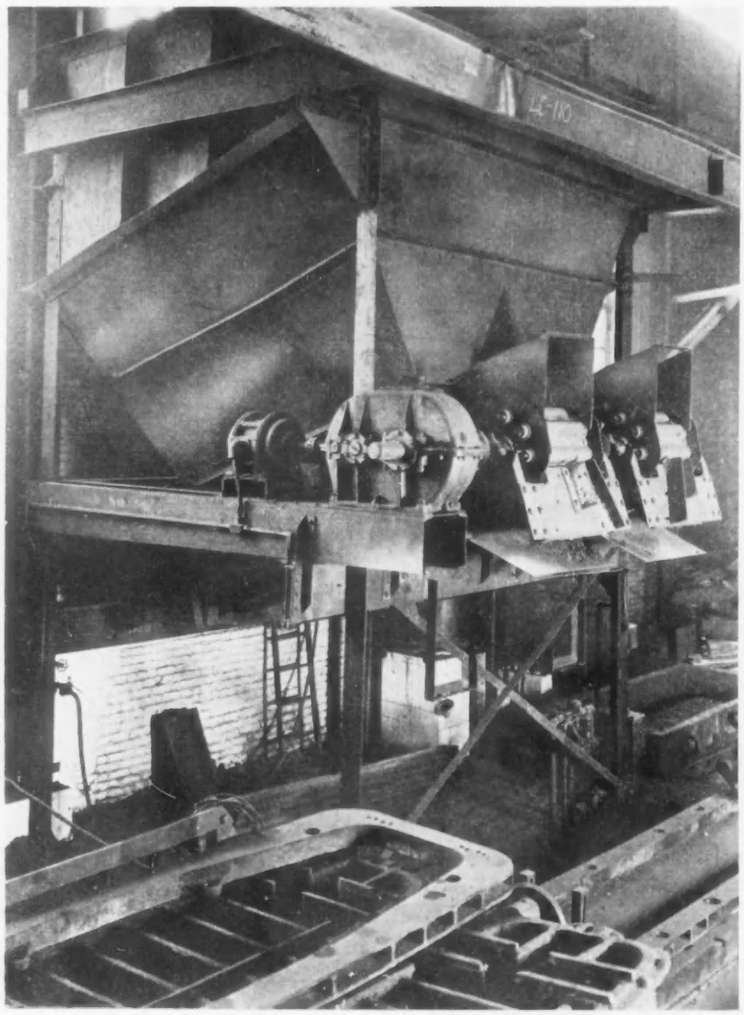
Sand Lumps Are Broken in Screen

The lumps in the sand are broken up in the screen, which is equipped with side shelves to lift



SCHEMATIC diagram showing sequence and relation of handling and conditioning operations and the reclaiming of molding and core sand.





From this bin it is picked up by a cutting feeder and delivered by belt conveyor to chutes leading to two measuring hoppers from which it is drawn as required. Below the hoppers are two of the latest model No. 3 Simpson intensive sand mixers, each driven by a 50-hp. motor, with inclosed spur gearing and anti-friction bearings.

After the sand has been mixed, bonded and tempered to the right consistency it is discharged about every 2 min. through double pneumatically operated doors on to a distributing conveyor belt which carries it to the molding machine hoppers.

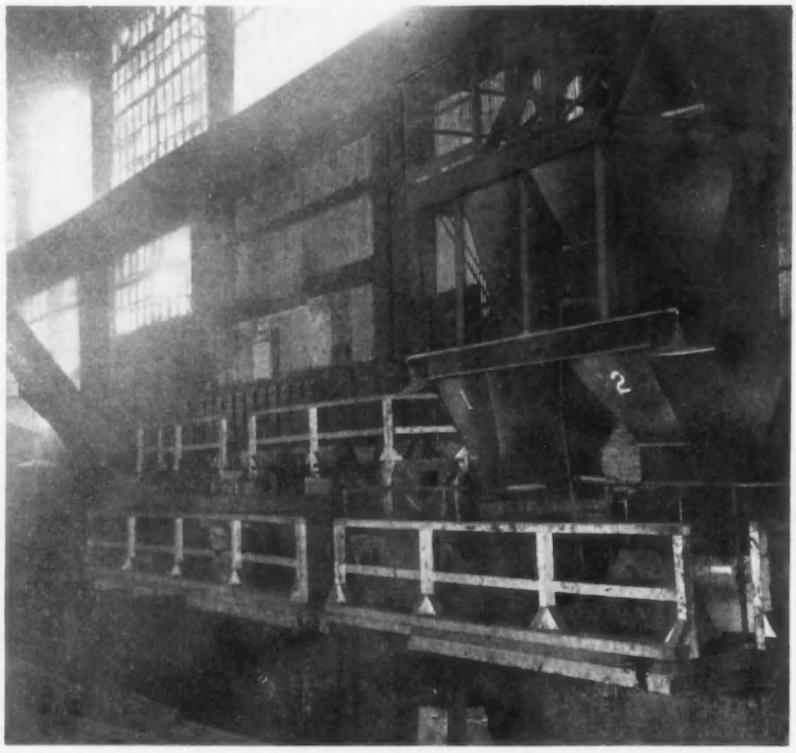
After the castings have been shaken out of the molds, they are placed on racks and allowed to cool. They are then picked up and suspended individually before rock drill type rappers over another grating where the cores are shaken out, and the castings are then ready for flogging, annealing and cleaning.

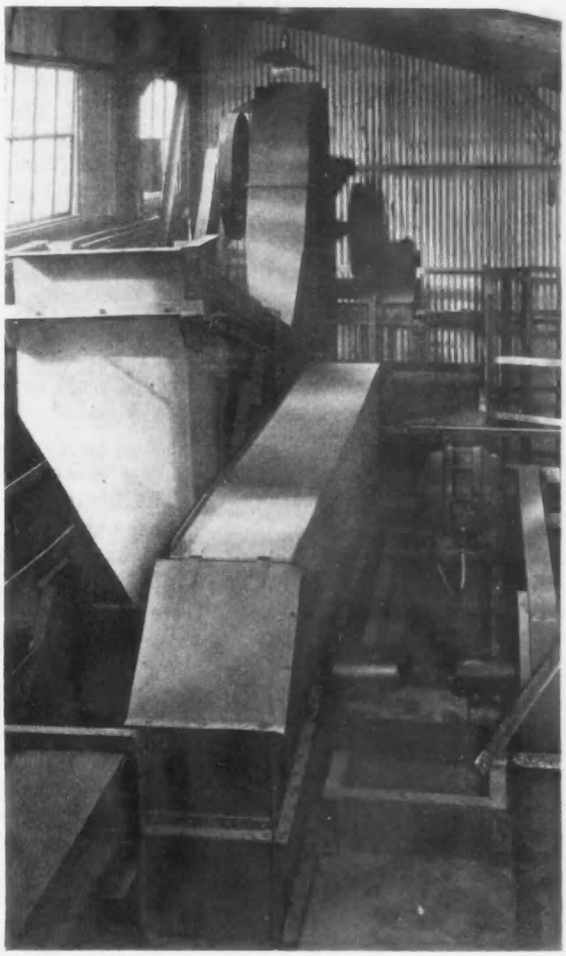
From the knockout hopper the sand is picked up by an apron conveyor and passed on a belt conveyor to a magnetic pulley, and thence to a bucket elevator which carries it to the top of the plant to a two-deck vibrating screen. The lumps are separated from the fines and good sand and are by-passed to a hammer-

ABOVE—Pressing a button releases the backing sand from the hoppers through these double apron feeds. At right—Measuring hoppers above the sand mills.

▲ ▲ ▲

and dump the sand as it revolves. Foreign material is rejected by the screen and tailings fall through into a box beneath. The good sand is discharged on a short length of conveyor belt, which carries it to a bucket elevator to be taken to the top of the bin housing. Here it is dumped on a tempering belt, where it may be wetted if desired and from which it passes to a conditioner. The conditioner consists of a heavy squirrel cage of steel rods which runs at high speed, thoroughly beating the sand until each grain is separate. The sand is then dropped into the 150-ton bin.





mill crusher, where they are pulverized and the sand is returned to the elevator.

Fines Go to the Refuse Bins

Sand passing through the top screen but retained by the lower screen is passed directly to the 75-ton storage bin, but the fines that pass through the second screen are delivered to the 35-ton refuse bin, which is periodically dumped into railroad cars on the siding and taken away. Sand from the 75-ton bin passes to a Frost facing mill, to the heap sand mill, or is emptied into railroad cars to be taken to other departments.

The backing sand is distributed by the conveyor belt from the mixers to four hoppers on the molding floor, two of which were installed with the sand-handling equipment. These hoppers are of steel plate construction and have capacity for 35 tons.

All that is necessary to release the sand from the hoppers is to press a button which sets two apron conveyors in motion, and the sand is discharged into the flask from a height of about 8 ft. Adjustable guides distribute the sand evenly.

At each of the two hoppers is an Osborn high-speed molding machine, with which it is possible to produce the two halves of the mold in less than a minute. The total time required for the production of a mold ready for pouring, including the insertion of cores, and the inspection, closing and gating, has been reduced to 4 min. with the new equipment.

After the flask is filled with sand, it is jolted powerfully for several seconds by a large air cylinder, which rams the sand evenly about the pattern. The roll-over table, pattern plate and flask are then raised and rolled over together electrically. An electrically operated transfer carriage with air-operated leveling beams is then run beneath the suspended flask which is lowered upon the beams and the locking wedges, clamping the flask to the table are removed. The pattern plate is then vibrated and lifted with the machine table clear of the flask, which is transferred by the carriage on to an inclined gravity roller conveyor inclined toward the companion molding unit.

Molds Are Completed on Conveyor

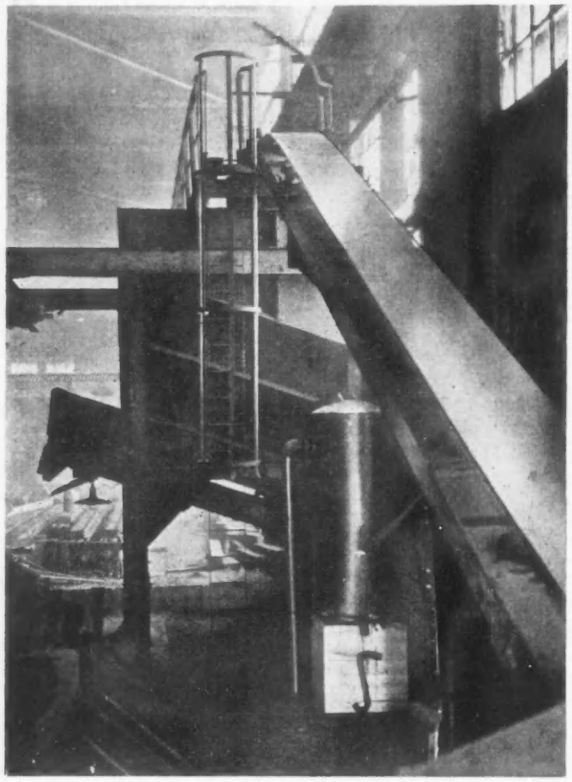
As the mold passes down the conveyor, cores are placed in position and the mold is inspected. Simultaneously with the preparation of the drag the cope is being molded on the second machine, and it approaches the drag mold on a parallel conveyor.

The drag flask is then transferred to the closing

At left—Conditioner and tempering belt, at the head of the bucket elevator. Below—In the reclaiming system, double deck vibrating screens separate dust from the reclaimed cores. ▲ ▲ ▲

line of gravity conveyors and the cope is lifted up, turned over and placed on the drag. The completed mold is then clamped and gated and rolled down the conveyor ready for pouring.

Considerable flexibility is afforded in the operation of the sand-handling system. Through the installation of an extra belt over the top of the storage bins, together with suitable sand chutes and diverting gates, it is possible to add reclaimed or new sand at will to the contents of the 150-ton backing sand bin. A spout from the 75-ton bin permits



An inclined belt, as shown above, carries the sand from the mills to the molding units.

the discharge of its contents, to be taken to other parts of the shop.

Both system are operated electrically throughout, the various stages in the systems being independently motor driven through totally inclosed speed reducers. A total of 31 motors is required for the operation of the two systems.

The control equipment for each unit is conveniently grouped in a central location on a platform in front of the equipment. All usual safety appliances have been incorporated together with special features in the system to make sure that the apparatus cannot be operated in the wrong sequence. There are, also, numerous safety stops.

With the new system, the Canadian Steel Foundries, Ltd., has found it possible to produce four times as many molds as by the former method of sand handling employed. The expenditure on facing sand and gaggers has been considerably reduced and molders have better control over weight than previously. As a result, castings are more truly uniform and, being smoother, are easier to clean.

The greatly increased production of molds brought up the problem of having a sufficient supply of flasks on hand. This was solved by the arrangement of short lengths of roller conveyors alongside the molding machines. As soon as the sand has been shaken out of a flask it is returned to this conveyor from which it may be lifted conveniently to the molding machines.

The gravity roller conveyors on the molding floor have been constructed on concrete slab floors to overcome any vibration in the completed mold before pouring.

The installation of the new sand-handling system has increased the amount of productive space available in this bay of the foundry. The foundry floor is now in an orderly condition, almost entirely free of sand. Thus have mechanical means solved many of the sand-handling problems of the Canadian Steel Foundries, Ltd.

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Hardness of Carbon Steels as Influenced by Carbide Particle Size

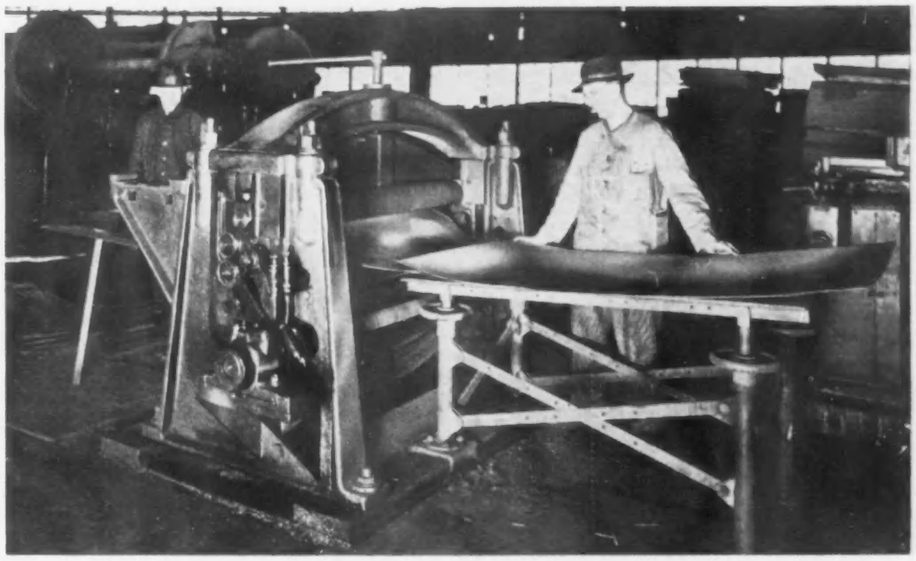
HARDNESS of carbon steels, as influenced by the size of iron-carbide particles developed by annealing at 1290 to 1330 deg. F. for increasing periods of time, has been pointed out by S. Shimura and H. Esser (*Stahl und Eisen*, Nov. 27, 1930). Steels of varying carbon contents, with 0.06 to 0.12 per cent Si, 0.08 to 0.16 per cent Mn, 0.10 to 0.12 per cent P, and 0.10 to 0.16 per cent S, were annealed in the austenitic range for an hour and the water quenched. Specimens were then heated at 1290 to 1330 deg. for ten minutes each, after which the Brinell hardness and the carbide particle size were determined. The same specimens were then subjected to successive reheatings for greater periods of time. Typical results are shown in the following table:

Time at 1300 Deg. (T), Carbide Number per Sq. In. (N), and Brinell Hardness (B) of Various Carbon Steels

		0.64 Per Cent C		0.82 Per Cent C		0.97 Per Cent C		1.16 Per Cent C		1.75 Per Cent C	
	(T)	(N)	(B)	(N)	(B)	(N)	(B)	(N)	(B)	(N)	(B)
Normalized	...	...	190	...	220	...	258	...	230	...	224
Quenched	...	...	528	...	580	...	632	...	692	...	706
Annealed	10 min.	136	349	128	380	133	412	111	380	77	370
Annealed	1 hr.	88	331	90	349	103	370	90	360	67	370
Annealed	4 hr.	65	300	68	322	77	340	44	340	44	360
Annealed	10 hr.	49	262	54	288	53	295	54	335	32	340
Annealed	20 hr.	44	241	44	241	39	252	41	288	26	288
Annealed	48 hr.	21	121	34	123	31	130	32	134	18	142

The hardness diminished as the time was lengthened, the maxima at the eutectoid composition becoming less pronounced at the same time. The increasing size of the carbide particles (decrease in N) at first had little influence on the hardness, but beyond a certain stage the hardness dropped rapidly until the Brinell values became nearly independent of carbon content. Evidently, small particles of carbide confer increased resistance to deformation to ferrite ground mass, but with large carbide particles the hardness of the mixture depends almost entirely on the ferrite constituent.

Sheet Separator Features Continuous Operation

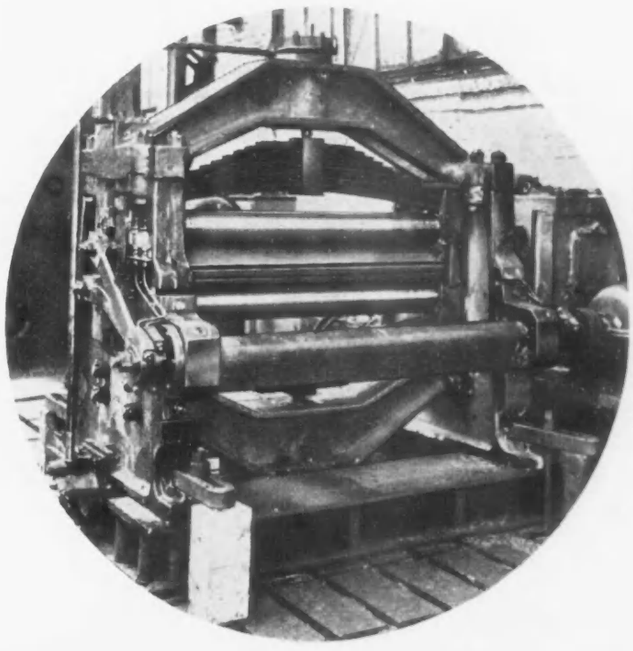


A MACHINE for separating rolled sheets which have adhered in stacking has been developed by August-Thyssen-Hütte, Hamborn on the Rhine, Germany. Designated as the Demag No. 4248 sheet "unsticking" machine, the unit is being marketed in the United States by the Ambold Machine Tool Corpn., 50 Church Street, New York.

The machine operates on a continuous system; sheets are fed from vertically-adjustable table at the front and are ejected on to a similar table in the rear. Sheets to be separated are placed over the ends of the pair of sheets already in the machine and are carried, in turn, between the rollers. The continuous separation of sheets thus obtained is emphasized as resulting in increased production.

A pair of vibrating blades are mounted on parallel shafts, and an opposed vibrating motion is imparted to the blade shafts through an eccentric shaft driven by a 7½-hp., 750-r.p.m. electric motor through a flexible coupling. The two pairs of rolls which draw the sheets through the machine are driven by a 12-hp. motor through a worm drive and gear box mounted at the side of the machine. There is also a flexible coupling inserted in this drive. The roller-driving motor is of the variable-speed type to permit adjustment of the feed in accordance with the degree of adhesion between the sheets. This speed adjustment is from 400 to 1200 r.p.m., which corresponds to a feed range of 2½ to 7⅞ in. per sec.

The pairs of rollers operate under spring pressure. Both the rolls and the separating blade are arranged for convenient removal and replacement. Sheets of a maximum width of 47¼ in. will pass through the machine; the separating blades are approximately 53⅛ in. long.



(Above) Continuous separation is obtained by placing one pair of sheets over the ends of the preceding pair.

(Left) Close-up view showing vibrating blades and feeding rollers.

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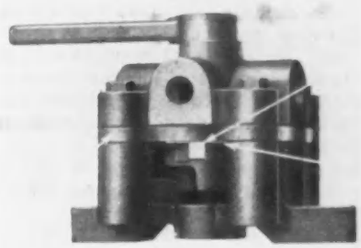
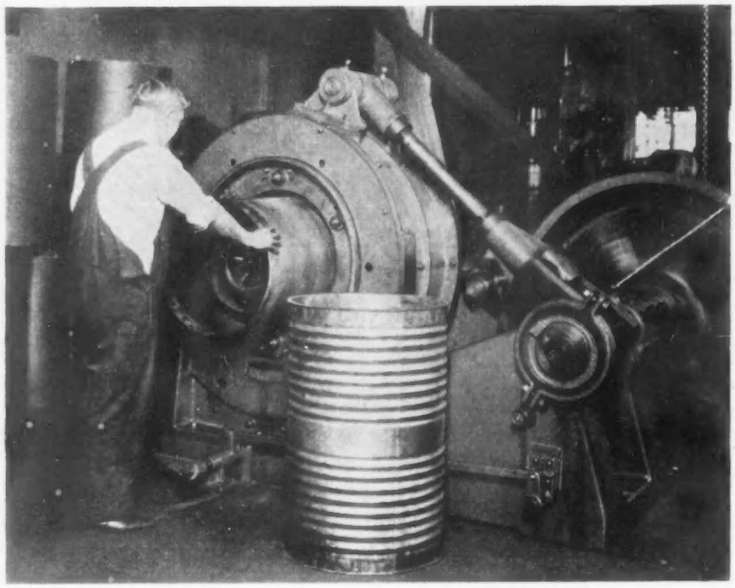
Air Valve Parts Easily Replaced

AN air valve designed for quick replacement of inexpensive wearing parts is being marketed by the Norin Engineering Co., 355 North Union Park Court, Chicago. All parts



are interchangeable and replacement is made without the necessity of grinding or lapping.

This valve, which bears the trade name "Noleak," consists of two main castings and a valve body which are not subject to wear. The parts that take wear are a thin bronze valve disk, a resilient disk and a bronze valve seat. This seat and the two disks are readily changeable by the removing of four screws which completely dissemble the valve. An even surface pressure is maintained by the soft resilient disk which is beneath the bronze valve disk. As the latter is in contact with the valve seat, the wearing surfaces are bronze against bronze. A small spring holds the valve against its seat when air pressure is cut off.



New Machine Corrugates Drums by Progressive Expansion Action

STEEL drum bodies may be flanged and corrugated by a semi-automatic machine of the expanding jaw type, a new product of the E. W. Bliss Co., Fifty-third Street and Second Avenue, Brooklyn, N. Y. It is pointed out that the expanding method of corrugating does not affect the thickness of the material in the drum body; other methods of corrugating are said to stretch the metal at the sides of the corrugations, resulting in strain-hardening that renders the walls susceptible to fracture at these points.

The new machine is provided with both inner and outer expanding members. In operation, one end of a drum body is inserted as shown in the accompanying illustration, and the operator depresses a foot treadle, causing the inner member to expand and the outer jaws to close progressively on the cylinder. Flanging takes place first; then the first section bead is formed, the second section, and so on until one-half of the drum is corrugated. At this point the inner jaw member collapses and the outer jaws expand, permitting the operator to remove the drum, turn it, and insert the other end in the machine. Two operations are required to complete a single drum body. From 10 to 12 operations a minute can be obtained by an experienced operator, this being equivalent to a production of from five to six finished drum bodies a minute.

The flanging and corrugating operations re-size the drums at each end, assuring an accurate fit with the tops and bottoms of the drums. The corrugations over the locked seam on the side of the drum are said to prevent this seam from opening under strain. In addition, drums corrugated by the expanding method are described as being from 10 to 20 per cent more resistant to collapse than plain drums, permitting metal of lighter gage to be used in some instances.

Operation at 750 r.p.m. requires 15 hp. Other specifications include: overall height, 8 ft. 3 in.; height from floor to center of drive pulley, 2 ft. 7½ in.; floor space required, 8 ft. x 9 ft. 3 in.; weight, 16,500 lb.

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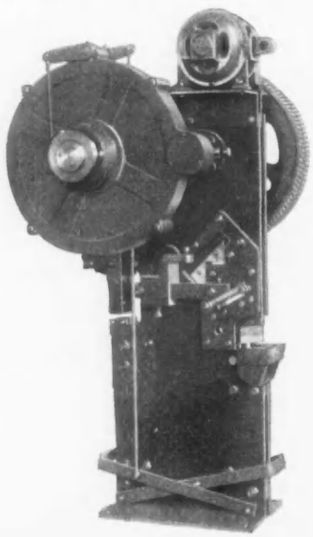
Punch, Bar and Angle Shear and Notcher

A COMBINATION machine that will shear, miter, notch and cope angles; shear flat and round bars; and punch to the center of 10 in. without change of set-up has been brought out by the Hendley & Whittemore Co., Beloit, Wis.



On mild steel the capacity of this combination machine is: Angles, square off, 3 x 3 x 5/16 in.; and angles, 45 deg. miter, 2½ x 2½ x ¼ in. The machine will notch and cope angles 2½ x 2½ x ¼ in.; shear flat bars 4 x ½ in. and round bars 1¼ in., and will punch a ¾-in. hole in ½-in. stock.

The main frame and lever of this machine, designated as the Beloit F-2, are fabricated from heavy steel plate. The eccentric shaft is turned from a solid bar of high-carbon steel and the enlarged eccentric portion of the shaft is in the center between the bearings to provide maximum strength at this point. Gears are machine cut and the pinion is cut from the solid steel bar. The main gear carries one half of a four-jaw clutch; both gears and pinion are covered by a cast-iron guard.

The clutch, of four-jaw positive type, provides for clutch engagement at every quarter turn of the main gear, and an adjustable automatic stop assures complete disengagement at any predetermined point of stroke. The clutch cannot be engaged without pressure on the foot lever, which is accessible from all sides of the machine. When the foot is removed from the treadle the machine makes a complete revolution, upon which the clutch is disengaged automatically. Long life of clutch parts and of automatic stop is a feature emphasized.

Die beds are solid steel castings bearing directly on the heavy frame plates. The machine is regularly furnished with a plain jaw for punching bars and angle iron. Vertical die space is sufficient to permit use of special attachments. Architectural or overhanging type jaws can be furnished. Specifications include: Throat depth, 5 in.; stroke of punch ram, ⅞ in.; strokes per min., 37; driving motor, 5-hp. 1800-r.p.m.; floor space, 30 x 48 in.; and approximate shipping weight, 3000 lb.

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Noteworthy examples of photography as used for various business purposes fill the pages of *Applied Photography*, a new magazine which made its first appearance May 1. The magazine is sponsored by the Eastman Kodak Co. as part of an extensive program to assist industrial and business firms in applying photography effectively in research, manufacturing, advertising and sales.

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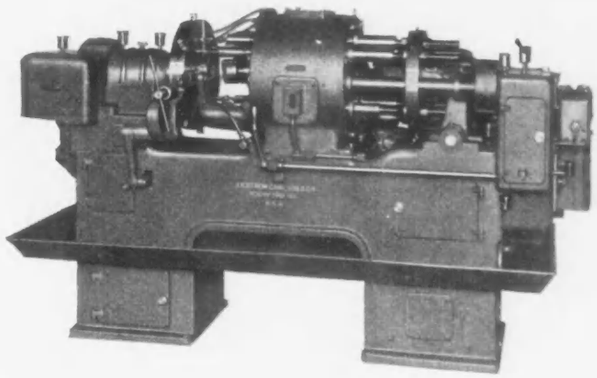
Growth of the Ex-Cell-O Aircraft & Tool Corpn., Detroit, from a small shop which, 12 years ago, pioneered in the standardization of drill jig bushings, to the present large establishment manufacturing a line of machine tools, gages and motor parts, is depicted in an attractively illustrated booklet recently published by this corporation.



Eight-Station Automatic for Drilling and Other Operations

FOR machining steel forgings having a tapered shank, Ekstrom, Carlson & Co., Rockford, Ill., has built the eight-spindle automatic here shown. The machine drills and reams a tapered hole 9/16 and 5/16 in. in diameter to a depth of 2⅛ in., faces the end of the forging shank, and taper turns the outside diameter for a length of 1 in. Operations are continuous at seven stations, while loading and unloading is performed at the eighth station.

Each station is provided with self-centering work-holding jaws; in loading and unloading a double-handle key wrench is employed; this wrench is automatically disengaged from contact with the jaw screw before indexing takes place and is again brought automatically into contact with the screw after indexing is completed. Indexing of the work-head is accomplished automatically by cams timed in unison with the spindle feed. Five operating speeds, 2, 2½, 3, 3½ and 4 cycles per min. are obtainable through change gears located accessibly at the front of the machine.

Spindles are hardened and ground and run in long bronze bearings, which are force lubricated. Drill spindles run 740 r.p.m. and reaming and turning spindles run 305 r.p.m. All spindles are adjustable and can be readily set to the proper depth of cut. Power is transmitted from a 7½-hp. 1200 r.p.m. motor to spindle gear box by means of silent chain. The coolant pump has capacity of 24 gal. per min.

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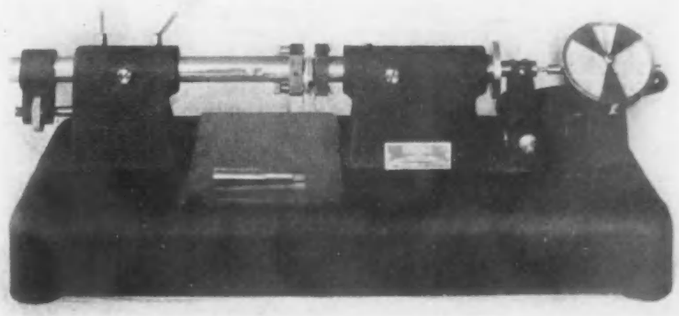
Dial Gage Permits Rapid Checking of Threads

AN adjustable tolerance shutter on the dial of the thread-checking gage, here illustrated, facilitates rapid checking of taps, thread gages or other threaded parts requiring precise measurement. A new development of the Federal Products Corpn., Providence, R. I., the instrument is made in accordance with a general design originally suggested by engineers of the J. M. Carpenter Tap & Die Co., Pawtucket, R. I.

The three-wire method of thread checking is employed. The single wire is floating and the two-wire pair has a semi-floating mounting which may easily be changed to accommodate threads of various pitches. Work can be checked in either horizontal or vertical positions.

Readings are taken on an indicator dial, graduated to 0.0001 in. The tailstock is provided with a vernier screw for fine adjustment. Spring pressure exerted by the anvils against the part being gaged may be varied from ½ to 6 lb. The gage may be operated either by hand or by means of a foot treadle connected with the small lever appearing at the right in the illustration. Overall length of the gage is 24 in.; it weighs 200 lb.



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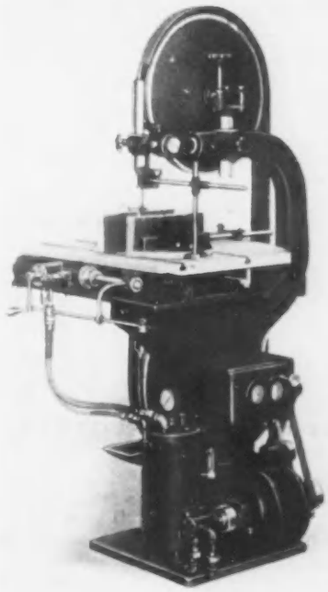
New Model Band Saw with Hydraulic Feed

A NEW model, designated as type JM, has been announced by William Laidlaw, Inc., Belmont, N. Y., as an addition to this company's line of metal-cutting band saws. While primarily intended for use in tool rooms and other shops having a variety of



cutting work, the machine is also suitable for production work.

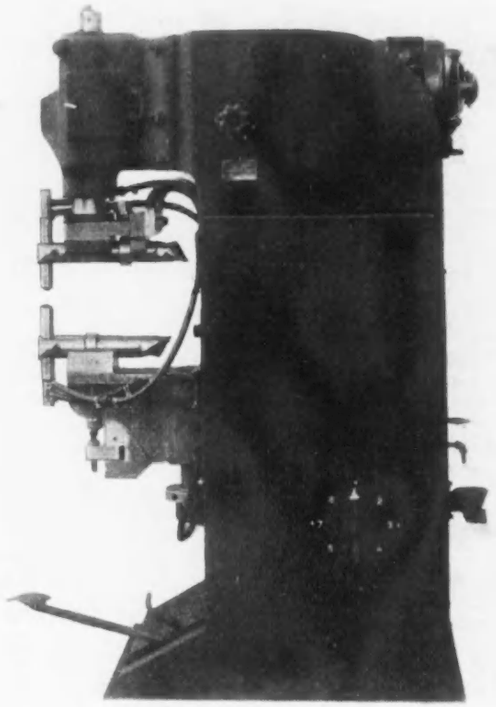
The low pressure hydraulic feeding system of the new model is essentially the same as that used on other Laidlaw band saws, described in THE IRON AGE of Oct. 24, 1929, and June 26, 1930.

Eight speed changes provide a range of saw travel from 100 to 725 ft. per min. Special machines for cutting aluminum and other soft metals may be obtained with speeds up to 2900 ft. per min.

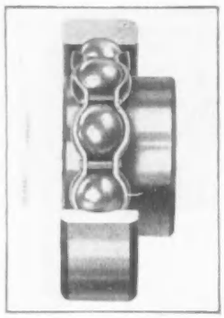
Ball bearings are used throughout; the 26-in. square table, mounted on hardened steel balls, is held down by an annular ball bearing that contacts an inverted way on the under side of the table. The carriage is pivoted at the center to permit cutting of pieces of any length without interference with the saw on the opposite side.

The machine is driven by a ¾-hp. motor. Overall height is 68 in.; height from floor to carriage, 37 in.; floor space required, 38 x 38 in.; weight, 1115 lb.

RECENT DEVELOPMENTS IN



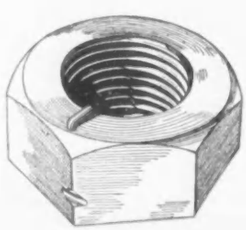
THIS "Federal Senior No. 12" spot and projection welder, a new product of the Federal Machine & Welder Co., Warren, Ohio, features flexible control and operation to meet the needs of high production. Welded steel fabrication has made the machine 1500 lb. lighter than cast-iron construction without sacrifice of strength, rigidity or appearance. Other features include an eight-step rheostat for 60 per cent current variation, adjustable knee and special universal horns. Three gear sets and a four-speed motor with hand-dial control provide operating speeds ranging from 15 to 130 spot welds a minute. A close-coupled secondary circuit is obtained by the lower arm mounting which is clamped directly on the face of the transformer.



A SERIES of single-row ball bearings, designated as the SRB wide-inner type, is announced by Standard Steel & Bearings Inc., Plainville, Conn. These bearings are of the same design and dimensions as this company's single-row "maximum capacity" bearings, except that the inner ring has the same width as that of the double-row bearing of corresponding size. The additional width of the inner ring permits the bearing to be used without a locknut, thus effecting a saving in expense to the user. The bearings are recommended for electric motors and other applications where only a locating or nominal thrust is encountered.

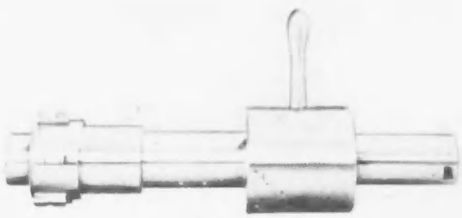
THIS ball-bearing grinder pump, driven at 1725 r.p.m. by a 2-hp. motor, delivers grinding compound at the rate of 120 gal. per min. It is made by the Ruthman Machinery Co., Cincinnati, Ohio, in sizes ranging from ¼ to 5 hp. for both immersed and outside installation. The centrifugal impeller is of non-clogging type. Ample clearance is provided between the impeller and housing, and further protection is assured by an intake strainer. No packing, felt washers or close fitting moving parts come in contact with the grinding compound. The upper bell or motor flange is totally inclosed to exclude dirt and drippings from the motor. A conduit box, through which the current leads enter the motor, is emphasized as a safety factor.

NO washers or other separate locking members are used with this locknut which has been placed on the market by the General Automatic Lock Nut Corpn., General Motors Building, New York. A pin, permanently inserted in the face of the nut and arranged to engage the threads of the bolt, provides the locking feature. Locking is automatic and said to be proof against loosening from vibration or shock. Nuts of this type can be repeatedly removed and replaced without damage to any part; they are removed simply by applying enough pressure with an ordinary wrench to spring the pin. They are made in all sizes and for any standard thread.



MACHINERY AND MACHINE PARTS

VALVE seat ring threads are cut by the Victor valve seat tap illustrated below, a new tool developed by the Landis Machine Co., Waynesboro, Pa. Fitted with collapsing chasers, the tap may be inserted through openings which are smaller than the diameter of the threads to be cut. When the tap has entered the valve body, the chasers are expanded by means of a handle provided for that purpose. The chasers are double ended, a feature which permits the threads for both seats of a valve to be tapped with the same chasers in one chucking. Valves having angle seats can be handled in the same way as those with parallel seats. For the former type, however, a fixture of the trunnion type is used. This has stops for bringing the valve-seat ring openings in line with the tap.



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ONE-PIECE acorn nuts are now being manufactured from solid steel bar stock by the Acorn Nut Co., 901 Hofmann Building, Detroit. The patented blind tapping process employed is said to make accurate threading possible on a quantity production basis. Strength, extra tap depth and a durable finish are obtained.

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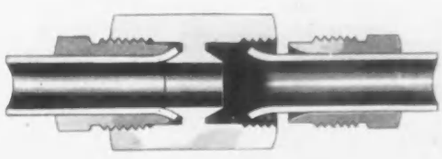
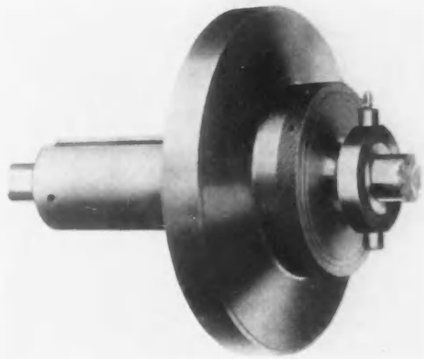
THE accompanying sectional view shows how a tight, permanent metal-to-metal joint is made with the Dieform fittings and tubing recently brought out by the Bailey Meter Co., Cleveland, for small pipe lines of all kinds. The tube nut serves as a die in flaring the tubing. The moderate angle of flare is described as preventing the tube from splitting or cracking and also permits the use of hard drawn tube. Fittings of brass, monel metal or steel may be used with copper or steel tubing.





THIS friction disk clutch, which is totally inclosed in both engaged and disengaged positions, is offered by the Dodge Mfg. Corpn., Mishawaka, Ind., for machinery and power transmission applications. Safety, full protection against dust, compactness, and large friction area are the features emphasized. Asbestos friction disks with ground faces are used. The slip ring is heavy and may be furnished with either bronze or ball-type bearings. Its movement is positive and said not to be affected by wear of the friction material or adjustment of the clutch. The self-loading toggle mechanism promotes ease of operation. One point adjustment is provided. Close tolerances are maintained in manufacture to assure proper balance and complete interchangeability of parts.

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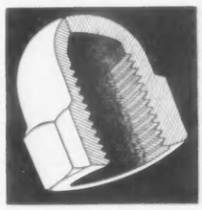

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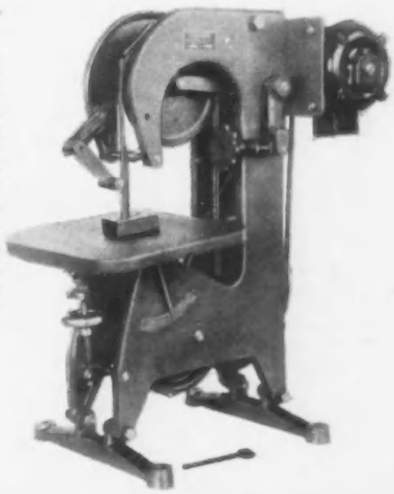
GROB BROTHERS, West Allis, Wis., has brought out a bench size filing machine of the continuous band type. The machine, designated as the model B1, is similar to the larger units of the same make which were described in THE IRON AGE of Aug. 28, 1930. It is suitable for tool and die making and will finish flat surfaces up to 4 in. in height. The drive is by a ¼-hp. motor. The machine is 28 in. high and the table has a working surface measuring 12 x 14 in. The unit weighs 150 lb.



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Foundrymen Hold Thirty-Fifth Annual Meeting in Chicago

DESPITE unfavorable economic conditions in the foundry and allied industries, the thirty-fifth annual convention and exhibition of the American Foundrymen's Association at the Hotel Stevens, Chicago, May 4 to 7, was a success. Comparisons must be made with the affair of a similar character—a small or limited exhibition—held in the same place in April, 1929. In attendance this year's meeting was fully equal to that one, with a registration of approximately 3100. It was of course much smaller than the gathering in Cleveland in May, 1930.

Technical Sessions the Feature

Technically, last week's convention was eminently satisfactory, the excellent program attracting a large attendance at practically every session—so much so that there was some complaint by exhibitors that the sessions were keeping people away from the exhibition. There were about 14 principal sessions of the various groups—gray iron, steel, malleable, non-ferrous, including sand, cost, apprentice and other fields. At these some 45 papers and committee reports were presented.

Gray iron problems easily held the spotlight both as to number of papers and attendance. There were 12 papers and reports presented at the three sessions devoted to this group, with almost every phase of cast iron problems covered, particular emphasis being placed on high-test iron and electric melting practice.

In steel foundry practice there were six papers scheduled at two sessions. Three of these were, "Chemical Composition as Employed for Classifying Carbon and Alloy Steels for Castings," by R. A. Bull, Electric Steel Founders' Research Group, Chicago; "Some Metallurgical Points in Acid Open-Hearth and Electric Steel for Castings," by F. A. Melmoth, Detroit Steel Casting Co., Detroit, and "Interrelationship of Pin-Hole Trouble and the Low Ductility Problem," by George Batty, Steel Castings Development Bureau, Philadelphia.

Considerable Attention to Non-Ferrous Subjects

That non-ferrous problems are by no means being neglected is evidenced by the nine papers at three sessions, dealing with cupola melting of brass, bronze pressure castings, use of the X-ray and permanent molds.

R. S. MacPHERRAN
Whiting Medallist

Only one session was devoted to malleable iron at which one paper and one report on refractories were offered besides some discussions of committee reports and problems. The lack of papers was due to some disappointments, and it was also a fact that the symposium on malleable iron, scheduled for the June meeting of the A. S. T. M., was recognized as causing the deficiency at this meeting.

There were the usual sessions on cost, sand and apprentice training at which four, six and two papers respectively were presented. A new feature was a round table meeting devoted to pattern production which was profitable and successful.

Special attention to some of these various sessions or individual papers will be given in forthcoming issues of THE IRON AGE.

Many Shop Operation Courses

This year, perhaps more than ever, the shop operation courses in gray iron, steel, malleable, non-ferrous and foundry sand attracted wide interest. There were 16 simultaneous meetings of this character, usually at 4 o'clock each afternoon, conducted by leaders in each field. There were also three round-table luncheons on steel, malleable and non-ferrous problems respectively at which live practical questions were discussed.

A general meeting opened the convention, at which President N. K. B. Patch delivered a splendid address, extracts of which were published in THE IRON AGE last week. His plea for less expansion and more concentration on present activities and problems by associations in general was warmly received.

At this meeting the exchange paper of the Institute of British Foundrymen, "Some Notes on the Structure of the British Foundry Industry," by V. C. Faulkner, editor, *Foundry Trade Journal*, London, was presented by John Shaw of Southsea, England, who has attended the last three conventions of the A. F. A. The author claims that the British foundry industry is "infinitely more varied than that of any other country" as a result of the fiscal policy of free imports which has been in operation in Great Britain for about a century and because of the considerable export business.

Officers Announced at Annual Meeting

The annual meeting this year was held in the afternoon of the last day. There was the usual report of the nominating committee for officers for the coming year. These are found in an adjoining column. Owing to the death of Ray M. Doty, who had been originally nominated as a director, the board of directors nominated A. G. Storie, vice-president of Fittings, Ltd., Oshawa, Ont., who was present at the convention.

Winners of Apprentice Contests

Successful candidates in the apprentice contests were made public at this meeting by the committee on awards. The winners were as follows:

Gray Iron Molding—First, Thomas Smedley, Red Jacket Pump Co., Davenport, Iowa; second, Victor Sanders.

E. H. BALLARD
President

John Deere Harvester Works, East Moline, Ill.; third, Rollo Van Camp, French & Hecht, Davenport, Iowa.

Steel Molding—First, William Norton, Hammond, Ind.; Ralph Adams, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; Louis Chick, East Chicago, Ind.

Pattern—First, Herbert Larsen, John Deere Harvester Works, East Moline, Ill.; second, B. F. Kafczynski, George H. Smith Steel Casting Co., Milwaukee; third, Edward G. Janda, Milwaukee Pattern & Mfg. Co., Milwaukee.

Resolutions Passed

Resolutions were passed expressing admiration for the achievements and regret over the loss of three prominent members during the past year: Dr. Richard Moldenke, Alfred E. Howell and Ray M. Doty. At the opening session on Monday, the gathering stood in silent memory of these three formerly active workers.

Other resolutions covered appreciation of authors of papers, of the policies of the officers and directors, and of the principles and precepts of the A. F. A. as expressed by the address of the retiring president, N. K. B. Patch.

OFFICERS AND DIRECTORS

PRESIDENT:

E. H. Ballard,
Foundry Superintendent
General Electric Co., West Lynn, Mass.

VICE-PRESIDENT:

T. S. Hammond,
President, Whiting Corpn.,
Chicago.

DIRECTORS FOR THREE YEARS:

N. K. B. Patch, secretary,
Lumen Bearing Co.,
Buffalo.

W. D. Moore, president,
American Cast Iron Pipe Co.,
Birmingham.

F. L. Wolf, technical superintendent,
Ohio Brass Co.,
Mansfield, Ohio.

Dan M. Avey, editor,
FOUNDRY,
Cleveland.

A. G. Storie, vice-president,
Fittings, Ltd.,
Oshawa, Ont.

Casting Steel Guns Centrifugally

The annual meeting was followed by an address by Col. T. C. Dickson, Watertown Arsenal, Watertown, Mass., on "Centrifugal Casting of Guns." This supplemented some of his recent addresses, one of which was abstracted in THE IRON AGE, May 22, 1930, and revealed that all such guns are now made of an alloy steel, usually molybdenum, made in high frequency induction furnaces, the metal being poured directly from the furnace into the casting machine.

British Foundrymen Present

Besides John Shaw of the Institute of British Foundrymen, there were two other foundrymen from that country who took an active interest in the week's activities. One was Walter C. Macartney, managing director of the Broad Oak Works of Markham & Co., Ltd., Chesterfield, and the other Thomas C. Firth of the Brightside Foundry & Engineering Co., Sheffield. Both are spending a few weeks visiting American plants.

T. S. HAMMOND
Vice-President

An Interesting Banquet

At the banquet, attended by about 300 men and women, Wednesday evening, May 6, and presided over as toastmaster by Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., Birmingham, the J. H. Whiting gold medal of the association was presented to Ralph S. MacPherran, chief chemist, Allis-Chalmers Mfg. Co., Milwaukee, by Fred Erb, past-president. The award was made in recognition of Mr. MacPharren's many valuable contributions to the gray iron casting industry.

The chief speaker was Dr. William S. Sadler, of Chicago, a celebrated neu-

(*Concluded on page* 1647)

NEW DIRECTORS FOR THREE YEARS

N. K. B. PATCH

F. L. WOLF

W. D. MOORE

A. G. STORIE

DAN M. AVEY

Gear Manufacturers Hold Fruitful Meeting at Buffalo

A COMPREHENSIVE program of papers and reports, both technical and commercial, featured the fifteenth annual meeting of the American Gear Manufacturers Association, held last week at the Hotel Statler, Buffalo. In common with other association gatherings in this year of depression, the attendance was somewhat less than usual, but in excellence of program and active discussion this meeting was outstanding.

The technical program included a notable paper on the strength and durability of gear teeth and highly useful recommended practices covering inspection, nomenclature, and the computing of the allowable tooth loads and stresses in bevel and spiral bevel gears for industrial applications. Progress reports were submitted by ten or more other standardization committees, as noted below, and two sessions of the meeting, held May 7, 8 and 9, were devoted to commercial matters.

All Officers Reelected

Election of officers resulted in the renaming of B. F. Waterman, engineer, Brown & Sharpe Mfg. Co., Providence, as president. E. W. Miller, chief engineer, Fellows Gear Shaper Co., Springfield, Vt., and John Christensen, president, Cincinnati Gear Co., were reelected first and second vice-presidents, respectively, and W. G. Jones, president, W. A. Jones Foundry & Machine Co., Chicago, again serves as treasurer. T. W. Owen, 3608 Euclid Avenue, Cleveland, continues as secretary.

Three Additional Associate Members

Balloting for membership on the executive committee resulted in the reelection of F. B. Drake, Johnson Gear Co., Berkeley, Cal.; E. W. Miller, Fellows Gear Shaper Co.; E. S. Sawtelle, Tool Steel Gear & Pinion Co., Cincinnati; and P. L. Tenney, Muncie Products division of the General Motors Corpn., Muncie, Ind.

Three additional associate members were admitted to membership. They were: W. F. Weeks and H. C. Woodson, Boston Gear Works, Norfolk Downs, Mass., and E. P. Connell, Falk Corpn., Milwaukee. Paul Christensen is an additional executive member of the Cincinnati Gear Co.

The fall meeting of the association will be held at Pittsburgh in October, the exact dates to be announced later.

B. F. WATERMAN

Mr. Waterman, engineer Brown & Sharpe Mfg. Co., again heads the American Gear Manufacturers' Association.

TWO sessions, presided over by E. S. Sawtelle, chairman of the commercial standardization committee, were devoted for the most part to discussions of uniform cost accounting procedure, with special emphasis on burden distribution and allocation of expense incurred in the handling, storing, waste of material. Formal discussion was contributed by W. F. Coleman, Jones Foundry & Machine Co.; W. F. Weeks, Boston Gear Works; D. W. Mort, Westinghouse Electric & Mfg. Co.; L. J. Flynn, Gears & Forgings, Inc.; E. P. Connell, Falk Corpn., and Paul Christensen, Cincinnati Gear Co.

Establish Volume of Business Index

The association has established a volume-of-gear-business index based on dollar values and issued monthly in the form of a graph. Orders for automotive gears, for industrial gears of two or three classes, railway gears, and speed reducers—small, large and medium—are covered by separate charts. A composite graph, such as reproduced herewith, is also made. This shows the relative monthly volume of orders in the gear industry (all classes) in 1928, 1929 and 1930, with comparisons for the first three months of 1931. The data from which this index was compiled was furnished by only part of the membership.

In addition to their value to gear makers, these statistics, it was held, should be of service to industry in general. The gear business ought to be an index of general business activity, and in time the variations in total volume of this business will give economists in general another index to work with.

Suggested revision of the association's uniform proposal sheet, presented by J. H. Jackson, secretary, Pittsburgh Gear & Machine Co., was, after some discussion, accepted as recommended practice.

Among other suggestions adopted were the dropping from the form of all cash discounts, and the inclusion of the guarantee statement, which in effect binds the company to a three months' guarantee against defects in material and workmanship. A few of the paragraphs of the previous practice have been dropped, because they duplicate other clauses, and the wording of some of the remaining paragraphs has been changed in the interest of clearness.

G. L. Markland, Jr., chairman of the board, Philadelphia Gear Works, and the association's representative in the United States Chamber of Commerce, outlined the proceedings of the recent meeting of that organization at Atlantic City. He urged that A. G. M. A. members in participating in their local chamber of commerce meetings emphasize the viewpoint of the manufacturing industries as regards unemployment insurance and other economic proposals now before the country.

New Data Facilitate Spur Gear Design

AS stated above, an outstanding contribution to the meeting was a paper on "Strength and Durability of Spur Gear Teeth," by Earle Buckingham, associate professor, Massachusetts Institute of Technology, Cambridge, Mass., and acting chairman of the special research committee on the strength of gears.

Increment loads due to shocks caused by inaccuracies of tooth form or spacing have heretofore been considered to be proportional to the trans-

mitted loads. Professor Buckingham's work in connection with the A. S. M. E. and A. G. M. A. special research on gears show that in the case of metal gears the increment load is almost independent of the applied load. From this new principle he develops methods of calculating both the breaking and surface stresses, and these new methods will enable designers to select pitch and face proportions with greater certainty than heretofore. An abstract of this notable paper will be published in a forthcoming issue of THE IRON AGE.

In the discussion of his paper, Professor Buckingham pointed out that in view of the research findings, the A. G. M. A. might profitably undertake the setting up of definite limiting tolerances for different classes of gears. It was pointed out that if the analysis given in the paper is substantially true, it has application to all types of moving parts. Experimental data will also be obtained on samples of helical gears.

W. E. Sykes, Farrel-Birmingham Co., emphasized the value of the paper in drawing attention to the fact that the main factor in gear tooth design is resistance to wear, rather than beam strength. Most gear troubles, he held, are due to lack of accuracy. B. F. Waterman, president of the association, pointed out that the paper again shows that "the best gear is the best made gear." Making of good gears requires good machines, good workmanship and, most important, good supervision, he said.

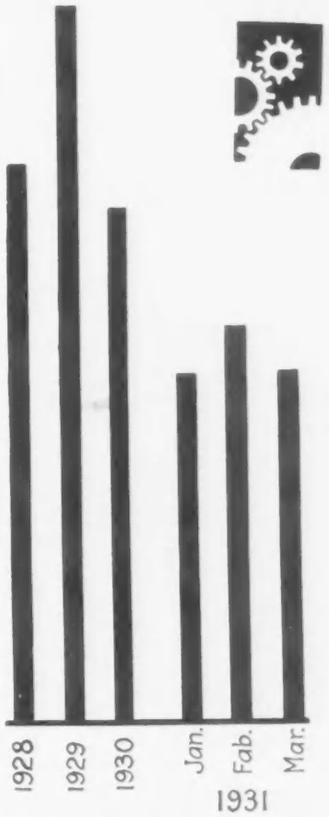
Reporting for E. W. Miller, A. G. M. A. representative on the special gear research committee, Professor Buckingham said that in addition to the work outlined in his paper, a series of test runs of non-metallic gears had been completed on the Lewis machine at Massachusetts Institute of Technology, the results being similar to those in the committee's progress report No. 13. Semi-steel gears of various types are being tested to obtain values as to surface fatigue limit. An investigation of dynamic loads on ball bearings has also been started.

Gear Nomenclature and Inspection Practice Adopted

Reports submitted by the several subcommittees of the A. G. M. A. general standardization committee, which is headed by A. A. Ross, engineer, General Electric Co., West Lynn, Mass., indicated definitely the steady progress being made in technical standardization.

A revised schedule of the completed and incompleted work of the various subcommittees has been prepared by the general standardization committee. In addition to its usefulness to the technical committees, this recommended practice program provides member companies with an up-to-date cross-reference index of what A. G. M. A. data should be in their files.

With the completion of its composite report on "Gearing Nomenclature," the nomenclature committee, headed by D. T. Hamilton, Fellows Gear Shaper Co., Springfield, Vt., has done notable work.



Gear business index showing relative volume of all classes as compiled by the gear manufacturers' association.

This report, characterized by A. A. Ross, chairman of the general committee, as an outstanding piece of A. G. M. A. work, and of direct use to every member of the association, was unanimously accepted as recommended practice for future design. Acceptance was followed by a unanimous vote expressing to Mr. Hamilton and his committee the gratitude of the association.

This nomenclature covering some 118 gear terms includes abbreviations for use on shop drawings and in formulas when presented in engineering or sales correspondence; symbols for the various gear elements that have a dimensional value for use in scientific and engineering calculations, in text books, etc., and a definition or description of gear elements, including pictorial representation. An index is provided to facilitate reference. This report, it was explained, is intended only as a "dictionary." The committee plans to prepare individual recommendations covering spur, bevel, worm and other gears and to include design formulas in the place of the definitions of the "dictionary." The formulas in the latter, it should be stated, are definition, not design formulas.

Discussion of this report centered around the inclusion of symbols. Various views were expressed pro and con, though all agreed to accept the recommended practice as presented. The coupling of the terms and definitions with pictorial illustrations of the terms received favorable comment.

Revise Gear Inspection Practice

Another committee report accepted with some enthusiasm as recommended practice was the revision of the gear inspection practice. Several items of the previous standard are omitted and the entire recommendation rewritten to include current practice. Functions of gear inspection followed topically are: What to check for, how to check it, and what equipment is available for inspection.

A feature is the use of photographs and line drawings to explain and clarify the inspection methods. Where feasible several methods of inspection are submitted, the report providing a "selective" or alternate method without violating the fundamentals of inspection. The revised practice covers cylindrical, taper and spline holes, keyway, Woodruff keys, spline shafts, shifter grooves, hub faces and several other items. A letter inviting the membership to submit data on alternate methods and photos of equipment and devices not included in the report will be sent out by the secretary. F. W. England, vice-president, Illinois Tool Works, Chicago, is chairman of the inspection committee.

Recommended practice for computing the allowable tooth loads and stresses in bevel and spiral bevel gears, industrial applications, was proposed by the committee, headed by F. E. McMullen, engineer, Gleason Works, Rochester. This report, accepted as recommended practice, is based on a study of a number of successful installations. In addition to the formula, it includes maximum wear load values, material factors, service factors and "Y" factors for both types of bevel gears.

The keyway committee, R. B. Zerfey, engineer, Tool Steel Gear & Pinion Co., Cincinnati, chairman, proposed an enlarged and revised table of keyways for holes in gears and for keystock sizes. The addition is for keyways for holes from 18 to 21 in. With the exception of two items, the revised table is identical with the proposed A. S. A. sizes. The revised report was accepted as recommended practice. The committee also suggested adoption of the S. A. E. standard for spline shafts and spline shaft tolerances; these will be printed for insertion in the A. G. M. A. data book.

The herringbone gear committee is studying tooth loading to derive a suitable load formula. Two formulas may be required, said Ira Short, engineer, Westinghouse Electric & Mfg. Co., South Philadelphia works, one for stress at the roots and another for stress at the point of contact. It is thought that for high-speed gears the crushing load at the point of contact will be a deciding factor. Tests of

helical and herringbone gears similar to the special research on spur gears at the Massachusetts Institute of Technology were suggested to check the formulas. It is felt that something of marked value will result from the work of this committee.

To Study Tip Relief

A study of tip relief is being made by the electric railway, mill and mine committee in conjunction with the tooth form committee. Analysis of replies to a recent questionnaire was said to show that tip relief in some form is considered necessary by the majority of gear manufacturers. Many companies do not specify tip relief, leaving it to the hob or cutter manufacturer to furnish their standard. Standardization in this regard entails a thorough investigation of the whole subject from both a practical and a theoretical standpoint, and will require quite a little time to complete. The committee is planning a report or paper for the next meeting; this will cover the effect of tip relief on deformation or deflection of gear teeth.

In addition to tip relief, the tooth form committee is working on a 20-deg. composite tooth system.

The worm gear committee is continuing its experimental determinations of the horsepower transmitting capacities of worm gearing of various specifications, the object being to establish a good working formula.

Different results obtained by using five different handbook formulas originally prompted this experimental investigation, which includes tests of model worm gear units at the Nuttall works of the Westinghouse Electric & Mfg. Co. On previous tests the worm gear units were loaded to 25 hp. Later tests at increased loads were said to indicate that "the maximum load at which the units will stand up is 45 hp." As shown by calculations from the five different handbook formulas, the load rating ranged from 2 to 16 hp., with an average of 8.6 hp. In the discussion of this progress report it was pointed out that the handbook formulas were based on single-thread worms. Other companies have been asked to make similar researches in other sections of the field.

This committee, under the chairmanship of W. H. Himes of the Westinghouse company, plans also to take up standardization of small diameter worm of open type with integral shafts, a type of worm that is being increasingly used.

Several additional items have been added to the program of the sprocket committee, which is headed by G. M. Bartlett, consulting engineer, Diamond Chain & Mfg. Co., Indianapolis. These include standardization of hubs, bolts and bolt holes for type D sprocket (detachable type sprocket), table of maximum chain velocities and table of load factors to be used in connection with horsepower and working load tables in the standard submitted a year ago. Also, uniformity in character of specification sheets and a simple chart for the selection of chain drives. More uniform practice in inverted tooth chains and sprockets will also be considered. Discussion of these proposals revealed that standardization of hubs, bolts and bolt holes of detachable type sprockets was especially desired.

The library committee, of which M. T. Schumb, Boston Gear Works, is chairman, proposed as an added activity the preparation in pamphlet form of the various A. G. M. A. recommended practices. Distribution of these to engineers not in the gear industry but who design and use gears would give rise to suggestions that would aid the work of the various committees. Such pamphlets would also, it is thought, foster wider recognition of the association's technical practices.

Other features of this three-day meeting included a paper on "Non-Metallic Gears and Their Operation Characteristics," by C. W. Mansur, plastic department, gear division, General Electric Co., and an address on "Photoelastic Study of Contact Stresses in Gears," by R. V. Baud, Westinghouse Electric & Mfg. Co. At the annual banquet on the evening of May 8, R. W. Lindsay, vice-president, Pratt & Lambert Co., Buffalo, was the principal speaker.

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Power-Driven Trucks Afford Flexibility in Handling Materials

ECONOMY of plant operation is desirable, whether at low or at high production rates. To obtain this objective flexibility of equipment is important, according to C. B. Crockett, Industrial Truck Association, who delivered a paper entitled "Industrial Material Handling by Power-Driven Trucks" before the national production meeting of the Society of Automotive Engineers, held recently at Milwaukee.

In general, material moves in one of two ways—in a continuous flow or a periodic flow—there being, however, no sharp line of demarcation between the two classifications. Power - driven trucks and tractors are suited to the periodic movement, as may be illustrated by the transportation of sheets. These are seldom used at the rate of unloading; further, their destination may vary and their point of unloading or origin may not always be the same. In one instance, an articulated power-driven truck unloading sheets direct from box cars to storage or point of use cut the cost of handling from 14c. a ton to 2c. a ton.

Automobile brakes, when loaded on trays in box cars, were charged 5.3c. each for handling cost. A power truck moving built-up skids direct to railroad cars reduced the cost to 8 mills, which includes the back haul of the empty skids.

Trucks used for handling large dies reduce handling cost and permit more frequent die changes, thereby affording an opportunity to reduce inventories.

The discussion of this paper centered on the comparative merits of internal combustion and electric trucks. Expressed opinions disclosed that, where the electric truck is suited to its job, its operating cost will probably be lower than the gas truck. However, each has its field of use. The gas truck is best adapted to continuous operation, high speed, long hauls and on poor pavement. The electric truck is favored for short hauls, slower speeds and on good floors. It was generally agreed that conditions are so variable that comparative tests are usually inconclusive.

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Sheet Steel Containers for Mailing "Cuts"

The advertising department of the American Sheet & Tin Plate Co., Pittsburgh, has developed a rather unique idea in the way of a shipping package designed to secure the safe delivery of electrotypes to publishers, without the all-too-frequent damage and abrasions received in the mails.

To accomplish this, this company is now using sheet steel boxes or trays, without lids, for shipping advertising electros. These trays are made of light gage black steel sheets, spot welded at the corners. They are produced by the Gem Mfg. Co., specialty manufacturer, Pittsburgh, at a price less than was formerly paid for wooden shipping packages.

The weight of the steel tray is but slightly more than the wooden one formerly used, and adds practically nothing to the parcels post charges of the average electrotype. This type of packing was approved by Post Office authorities before adoption.

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A three-year guarantee on the brushes of electroplating generators has been adopted by the Columbia Electric Mfg. Co., 1292 East Fifty-third Street, Cleveland. This is said by the company to be a departure from the usual custom. The brushes of the generators are adjusted and locked in position in the factory and further adjustment by the user to eliminate sparking and the attendant brush and commutator wear is said to be unnecessary.

International Chamber Wrestles with Economic Problems

WASHINGTON, May 12.—Covering a wide range of economic, industrial, financial, labor and other problems which are especially pressing for solution during the existing world-wide depression, the six-day conference of the sixth general congress of the International Chamber of Commerce came to a close last Saturday with the adoption of 42 resolutions. Shortly before adjournment, the congress listened to a radio address from Berlin by its new president, Franz von Mendelssohn, prominent German banker, who urged cooperation among business men of the world for peace and restoration of economic conditions upon a sound basis.

Perhaps by reason of the intricacies of the problems concerned, and the varying political and economic systems of the various nations, the resolutions were largely general in character in pointing to suggested remedies. Moreover, differences of view among delegates made compromise necessary in drafting resolutions and prevented resort to a more definite form of expression. These differences were strikingly shown in connection with such outstanding subjects as international debts, the tariff, and wage systems.

Tariffs Under Attack

Of all the subjects discussed at the congress, the tariff was probably the most heatedly debated. Vigorous onslaughts were made in so-called high protective tariffs, and were directed almost exclusively at the American tariff. British and German delegates in particular trained their fire on the American tariff, while the United States policy on this, as on debts and other international topics, was defended by American spokesmen. Among those attacking the protective tariff were Aloyse Meyer, president of the European Steel Cartel; Dr. Frank Edward Hamm, former minister of industry and trade in Germany; Dr. W. H. Coates, British economist; Sir Harry Brittain, London Chamber of Commerce, and Henry Bell, director of Lloyd's bank. Sir Arthur Balfour, Sheffield, England, steel manufacturer, in an interview, also assailed the American tariff, restating views that he has frequently expressed on the subject. On the other hand, the protective tariff was upheld by delegates from British dominions, especially Canada and Australia.

In commenting on the United States commercial policy, Henry D. Sharpe, president, Brown & Sharpe Mfg. Co., Providence, R. I., called attention to the flexible provisions of our tariff, which he hoped would have an important bearing upon our relations with other countries.

"So far as investigations and proclamations under these flexible provisions may lead to reasonable rates of duty, equalizing the costs of production in this country and abroad it should function as a helpful instrument in establishing a more friendly spirit in international tariff relationships," said Mr. Sharpe.

"The fact that the views of foreign producers may be placed before the (tariff) commission in its study of production costs represents a distinct forward movement, in my opinion, in tariff making and tariff adjustment. Perhaps it is not too much to hope that some day, as between all nations, certain fundamental formulæ establishing a recognized basis for tariffs may be set up and made known, and through general flexibility world tariff rates may be adjusted to conform to these determined and, we hope, reasonable formulæ."

Resolution Covers Armaments, Tariffs and Debts

A like view was expressed by Willis H. Booth, vice-president, Guaranty Trust Co., New York. This suggestion, in substance, was incorporated in one of the resolutions, offered by the American delegation, which dealt with restoration of world trade.

This resolution proposed reduction of armaments, as had been suggested by President Hoover in an address opening the congress. It also supported the suggestion for reexamination of international debts "on the basis of the underlying principles upon which they have been settled." Regarding tariffs, it was declared that they should not discriminate unfairly between nations; that embargoes should be exercised only against dumping or other unfair practices, and that "the machinery provided by some countries for the adjustment of tariff inequalities should be utilized without delay and all nations should unite in an effort to remove unjustifiable restrictions."

Private initiative and private operation of business enterprise were declared to constitute the most effective instrument to insure the progress of industry and to increase general prosperity. Declaring that the tendency for government expenditures to outrun revenue again imperils national budgets, the resolution said that "such a budget should contemplate every possible economy and must not impose such a burden of taxation as will disturb productive enterprise and add to unemployment."

Regularization of Employment Urged

The resolution dealing with the unemployment problem placed the congress on record as urging the Bank of International Settlements and similar institutions to lend their aid, so far as practicable, to increase the mobility of accumulated capital. Furthermore, it was declared, there should be an enlargement of the various ways and means which are available for this purpose with a view to facilitating the movement of capital under international coordination. The resolution commended owners and manager of business undertakings for their constructive efforts to provide stability in employment.

"By planning in its various forms many employers have demonstrated that in their fields fluctuations of employment can be substantially reduced," the resolution said. "The industrial undertakings of all countries should study these accomplishments and should endeavor to find their methods applicable to their circumstances, in order that they may to the greatest possible extent increase the certainties of employment." The chamber condemned measures of unemployment relief "which are merely palliative and do not go to the root of the evil." It was pointed out that all measures of unemployment relief must be consistent with sound economic principles "so as to avoid excessive drain on national income and to

refrain from restricting the mobility of labor and industry. Otherwise they only increase existing difficulties."

Debate on Wages

The limit of high wages in the United States has been exceeded and explains the attempt on the part of American industrial interests to obtain increased tariff duties, in the estimation of Aloyse Meyer, Luxemburg, president of the European Steel Cartel. This opinion was stated by Mr. Meyer in discussing "The Problems of High Wages" before a plenary session devoted to the general topic "International Economic Relations." With other foreign delegates, Mr. Meyer criticized high wages and protective tariffs as being important factors in causing the world-wide depression. Some were emphatic in adding international debts to the list.

Sharply opposing views were stated by American speakers. This was especially reflected by Secretary of the Treasury Andrew W. Mellon, whose views were accepted as those of the Administration. Mr. Mellon, in an address at a luncheon given by the American Bankers' Association to bankers from foreign countries, said that, instead of America lowering its standards of living, efforts must be made to improve them both in the United States and abroad. He declared that the economic depression that followed the war is, in part, "the price we pay for war and must be reckoned apparently as a seemingly unavoidable stage in the sequence of events." Prices must be revised and costs of production and output brought down to a point where the demand will again be stimulated and goods will move into consumption, Secretary Mellon said.

"In short, a balanced condition must be restored; and that may be done without a general reduction in wages, provided the period of readjustment is not too long drawn out and on condition also that we reduce costs by yet greater efficiency of labor, in management and in distribution." In mentioning debts, Mr. Mellon said that, "under the Young plan and the coordinating influence of the Bank of International Settlements, confidence has been established in the willingness and the ability of Europe to honor its obligations, whether these be debts arising out of the war or out of commercial undertakings started in the post-war period."

He declared that the trade of the world must settle into new channels and will increase in volume, notwithstanding tariffs and other barriers. It was declared that it is realized that, if world trade is to be built up, there must be give and take among nations.

Buying Power Depends on Living Standard

"But it must be remembered," Mr. Mellon continued, "that the all-important factor is purchasing power; and purchasing power, insofar as America is concerned, is dependent to a great extent on the standard of living which obtains in this country. That standard of living must be maintained at all costs; and certainly the present is no time to undertake drastic and doubtful experiments which may even conceivably result in breaking down the standard of living to which we have become accustomed. What we must strive for is to improve the standard both here and in other countries as conditions warrant. In fact, the ultimate solution of the world's difficulties would seem to lie in the possibility of building up a higher standard, especially in the great and as yet undeveloped consumer areas, and in creating there and throughout the world a steadily increasing demand for goods and services which Europe and America are prepared to supply."

THE RESOLUTIONS

Resolutions of International Chamber of Commerce represent a compromise.

Reduction of armaments, reexamination of international debts and removal of unfair discrimination in tariffs urged.

Individual initiative and private enterprise are declared to be the surest means of promoting progress and increasing general prosperity.

Industries are asked to further the work of employment regularization; unemployment relief measures that are mere palliatives are condemned.

Says Limit of High Wages Has Been Exceeded

In taking the other position, Mr. Meyer had explained that up to the present time no other country has been able to exploit natural resources as rapidly as America, and to obtain for its prosperity and well being the results that America has obtained from its resources.

"From another angle, the great natural resources of the country together with an extreme domestic market which permits not only a smooth movement of commodities, but also advantageous manufacturing of finished goods by the rational methods (mass production), and also the amount of available capital, form an ensemble of elements favorable to the payment of high wages," said Mr. Meyer. "Moreover, in spite of propitious circumstances, we are of the opinion . . . that the limit has been exceeded, which explains the attempt on the part of industrial interests to obtain an increase in customs duties."

Mr. Meyer expressed the opinion that evolution of the economic situation of Germany and of Great Britain show that the policy of high wages, although applied in a mitigated form, has not given satisfactory results in those countries. Without pretending that their depression is the exclusive result of high wages, "nevertheless it cannot be denied, Mr. Meyer said, "that they have been important contributing factors." He sought to make the point that high wages increase the cost of living. Great Britain was declared to be a free trade country on one hand, but a country of high wages on the other. Free trade and low cost of living, it was stated, must go side by side.

"Is not this abnormal condition existing in Great Britain responsible, to a large extent, for her economic ills?" Mr. Meyer asked. "England has been considering the abandonment of her free trade policy, which is a very grave problem and one which might upset the economic structure. Would it not be more logical to strive for a lowering of the cost of living, which should be possible in a free trade country, and to reduce wages in consequence? The wage earners would find no inconvenience, since real wages would not be modified."

Defends Mass Production

Mass production must of necessity be applied in Europe on a basis different from that prevailing in the United States, declared Oskar Sempell, Berlin, chairman of the Vereinigte Stahlwerke (United Steel Works).

"I would like to point out, however, that in regard to some processes, also in European countries, the necessity arises either to apply the so-called American method or to discontinue production altogether; or to rely upon the domestic market alone and to protect the latter by establishing high protective tariffs, something that cannot be done in practice. To mention an example, take, for instance, the iron and steel industry, which cannot be operated in any of the European countries as it was only 20 years ago. The same can be said of a great number of other commodities, as, for example, chemicals, glass, cement and many electrical goods."

Apparently inferring that tariff rates should be reduced, Mr. Sempell said that a downward revision is necessary to make possible payments which are not based upon economic demand and supply, but which must be made without economic compensation. It is known, he stated, that this can be done only by additional exports.

Mr. Sempell disagreed with previous views that the excessive rationalization in Germany has brought about the present crisis in that country. He declared that with a few exceptions no case of maladjustment between capital and service and reduction of production cost was encountered as the result of rationalization. He said that the technical progress in economic developments made possible by this method of production seems especially necessary in view of the prevailing depression.

"In all industrial countries we must endeavor to adjust the prices for industrial products and means of pro-

duction to the diminished purchasing power of the countries producing raw materials and the agricultural products, whether this decrease be a result of the increase in gold value, as some believe, or as a result of technical economic conditions in output of raw materials, as others think," said Mr. Sempell. "This cannot be done solely by reducing taxes and other state assessments, salaries and wages, but rather to a great extent by means of technical progress in industry."

Overproduction Temporary

While admitting that many industries are operating at over-capacity, Mr. Sempell said he did not believe this situation will be permanent. Illustrating this point, he cited the per capita consumption of iron in 1927 in different countries, using this as a measure showing the "degree of culture of a nation," and expressed the belief that this consumption would be considerably exceeded in rapidly developing countries, "for instance, Czechoslovakia and Poland, to say nothing of the countries of South America, Asia and Africa, . . . where the demand will increase a great deal through the development of railroad construction alone. The per capita consumption given in kilograms (2.2046 lb.) were: United States, 414; Germany, 246; Belgium-Luxemburg, 228; England, 218; France, 171; Czechoslovakia, 98; Poland, 50.

Speaking on "Some Problems in Production," Dr. Wallace B. Donham, dean of the Graduate School of Business Administration, Harvard University, declared that the best form of cooperation that can be given to a troubled world lies in the recognition that "the answer to our own problems is in our development at home and that we should do everything possible to strengthen Europe in its development abroad."

Opposes Low Tariff

With this idea of further cultivation of domestic rather than export markets, Dean Donham supported the principle of the protective tariff.

"There is little chance that we shall deliberately unstabilize numerous social groups, reduce standards of living here and concentrate our labor in the few industries where our home markets and mass production give us an advantage," said the speaker. "All of these consequences would follow a radical change in our old established tariff policy. Moreover, if these things were done and if we did reduce our standards of living, we should indeed become a dangerous competitor in the markets of the world.

"Because I am convinced that we are vitally interested in stability, both here and in Europe, I hope and I expect that we shall not enter into bitter competition with Europe for the less developed markets of the world. In my judgment Europe must keep these markets, certainly for the years immediately ahead, if it is to secure stability and increase its own levels of prosperity. I am convinced that our future for the next generation lies in the planned development of our home markets."

VIEWS OF SPEAKERS

Pronounced differences in viewpoints were voiced by individual speakers.

The high wage doctrine was attacked by Aloyse Meyer, president, European Steel Cartel, and defended by Andrew W. Mellon.

Protective tariffs were criticized by European speakers and upheld by American, Canadian and Australian delegates.

Overproduction is only "temporary," according to Oskar Sempell, chairman of the Vereinigte Stahlwerke, Germany, and his country must apply mass production methods or discontinue production altogether.

Costs are no obstacle to regularization of employment, in the opinion of Gerard Swope, president, General Electric Co.

Steady Employment Essential, Says Swope

In discussing "Regularization of Employment" before a plenary session last Wednesday, Gerard Swope, president of the General Electric Co., dealt with the general underlying principles from three points of view: that of the company, trade, or industry; that of society or the community as a whole and that of the employee, the particular human being involved.

Taking up the first point, Mr. Swope said that it is only comparatively recently that management has recognized the responsibility of considering, in addition to the fundamental of an adequate wage, hours of labor and conditions of work, that there are other considerations also, such as continuity and regularization of employment.

"Never before in economic crises has there been such an awakened civic consciousness, not only from the standpoint of the community, but also industry, in the recognition of this responsibility, which makes one hopeful that, as a result of all this thought and experiment, better methods of study, analysis and approach and finally the solution of this serious problem will be found."

Taking up the question from the point of view of society, Mr. Swope said it is to be expected that each trade and industry should carry its burden of cost of production of the various articles that society needs, including the element of cost that varying attendant industrial hazards to life or health contribute and in turn shall therefore be defrayed by the users of such articles.

Each industry would then defray the total cost, and society would not later be called upon "to bear a vicarious portion of this cost through taxation or charity," Mr. Swope explained. He declared that the distribution of the sums raised by taxation or charity can never be effectively done and is at best a makeshift, a method as bad for the community as it is often harmful and not desired by the recipient.

A human being laid off for lack of work, after the harrowing experience of endeavoring to find work, is never again as self-respecting and self-reliant a human being as he was before, Mr. Swope stated, in dealing with the subject from the point of view of the employee.

Cost No Barrier

"From the experience of the introduction of protection to workingmen against accidents, from the introduction of better methods of production and improved machinery, it has again and again been found that, notwithstanding the expenditures for protection, for better machinery and better methods and increased compensation to the man himself, the cost of unit production has been steadily lowered. It is confidently believed that if the fear of lack of work were removed from the mind of the workingman, he would approach his work with an entirely different attitude, his intelligence would be aroused, his interest stimulated, he would have enthusiasm and secure satisfaction from the work to be done. As a result, the quality of workmanship would be better; he would feel free to suggest better methods, which would lower costs and be reflected eventually in lower selling prices to the public and assure a wider sphere for the article itself."

Mr. Swope explained that the matter of regularization places a great burden on management in planning. The first problem was declared to be avoidance of seasonal and occasional variations of employment. Secondly, it was stated, in industries where these measures are seemingly impossible, at all event today, hardships of unemployment should be ameliorated. Suggesting the necessity for cooperation between industry and employees, Mr. Swope said that the more completely regularization of employment is effected, the less necessary is unemployment insurance on the part of industry or charitable and relief measures on the part of the community.

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All business of the Yamatake Co., 40 Rector Street, New York, export and import, will be transferred on May 31 to the Imperial Export Co., 11 Moore Street, New York, which will act as American representative of the company, head office of which is in Tokio, Japan.

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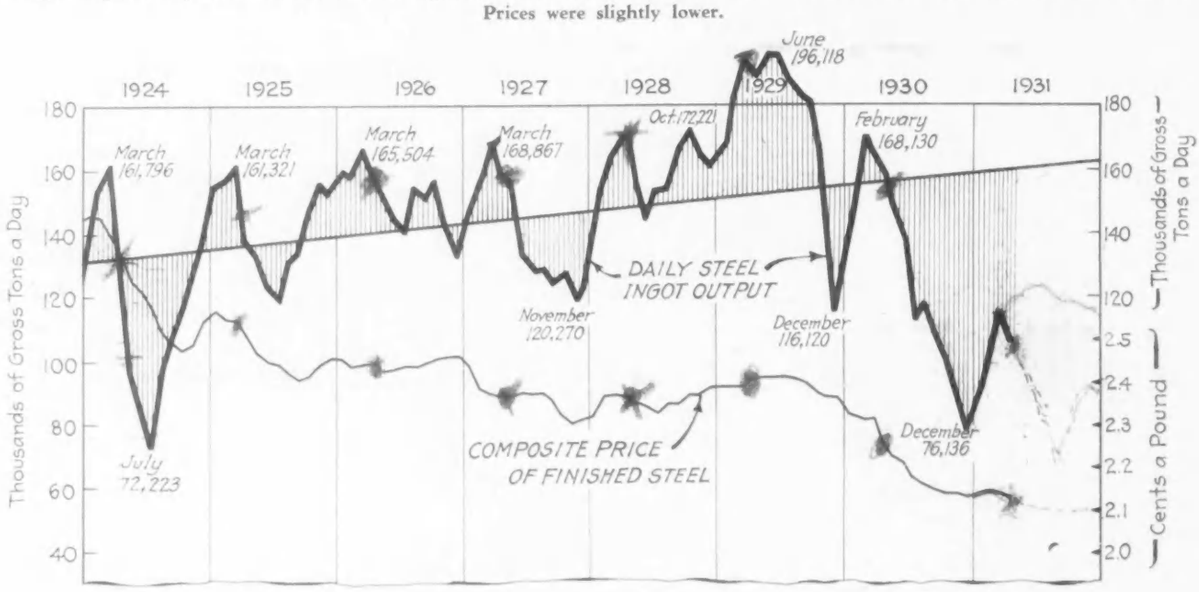
Bethlehem Steel Co. has placed an order with H. A. Brassert & Co., Chicago, for one set of patented insulated blow pipes for the No. 6 blast furnace at Johnstown, Pa.

Ingot output in April showed a decline of 9 per cent from that of March. The total was the smallest for April since 1921. Prices were slightly lower.



Steel Ingot Production in April Falls Back to February Level

PRODUCTION of open-hearth and Bessemer steel ingots in April declined about 9 per cent from the March figures (revised), both in the monthly output calculated by the American Iron and Steel Institute and in the daily average. There were 26 working days in each month.

These figures, together with those for 1930, have been revised in accordance with the finding that the reports received represented 95.21 per cent of the total open-hearth and Bessemer ingot production in 1930, whereas in 1929 the reporting companies accounted for only 94.27 per cent of the total.

Calculated output for all companies making these grades of steel ingots was 2,722,479 gross tons in April, against 2,993,590 tons in March and 4,109,492 tons in April, 1930. It results that the April total is the smallest for that month since 1921, when the output was only about one-half the current figure. Also, except for the period of the current depression, the April total was the smallest for any month since August, 1924.

On the daily basis, production was 104,711 tons, compared with 115,139 tons in March and with 158,057 tons in April of last year. Expressed in ratio to the ascertained steel-making capacity as of Dec. 31, 1930, the April output was 49.29 per cent, against 54.20 per cent in March, and 49.08 per cent in February.

Both open-hearth and Bessemer steel dropped during the month, and by approximately equal percentages, as may be noted from the table.

Total production for the first four months is calculated at 10,677,124 tons, against 16,177,169 tons for the first four months of 1930. The shrinkage of almost precisely 5,500,000 tons represents 34 per cent. The average operating rate during the first four months is given as 48.79 per cent, against 78.45 per cent a year ago.

These figures do not include electric and crucible steel. Approximately 0.8 per cent should be added to the tonnage figures to allow for these grades, in determining the total steel ingot output of the country.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Gross Tons)

	Reported by Companies Which Made 95.21 Per Cent of the 1930 Ingots		Calculated Output of All Companies		No. of Working Days
	Open-Hearth	Bessemer	Monthly	Daily	
Total, 1929	44,101,321	7,091,680	54,312,279	174,639	311
1930					
January	3,157,761	441,572	3,778,235	139,935	27
February	3,335,428	508,618	4,035,111	168,130	24
March	3,513,269	539,616	4,254,331	163,628	26
April	3,405,671	509,234	4,109,492	158,057	26
Four months	13,412,129	1,999,040	16,177,169	157,060	103
May	3,265,353	528,968	3,982,915	147,515	27
June	2,849,079	407,586	3,418,535	136,739	25
Six months	19,526,561	2,935,594	23,578,619	152,120	155
July	2,430,128	353,723	2,922,220	112,393	26
August	2,541,367	374,467	3,060,763	117,722	26
September	2,275,910	429,975	2,840,379	109,245	26
October	2,165,341	399,704	2,692,539	99,724	27
November	1,807,133	300,339	2,212,220	88,489	25
December	1,659,026	226,786	1,979,547	76,136	26
Total, 1930	32,405,466	5,020,588	39,286,287	126,322	311
1931					
January	2,044,298	296,620	2,458,689	91,063	27
February	2,085,529	296,972	2,502,366	104,265	24
March	2,504,060	346,139	2,993,590	115,139	26
April	2,275,404	316,668	2,722,479	104,711	26
Four months	8,909,291	1,256,399	10,677,124	103,661	103

GROUND HOGS AND LIONS

ON the second of February, according to tradition, the ground hogs emerge from their hibernation to take a look at the weather. Then back they go again to await the coming of spring. When they finally do emerge, with empty stomachs, a month or two later, there is a grand scramble for food.

During the past year we have seen considerable hibernation practiced in business and industry. Many two-legged ground hogs have remained curled up underground, as it were, waiting for somebody to start business going so that they could come out and eat again. What an exodus there will be of these chaps when the sun peeps out through the depression clouds!

These hungry opportunists will expect to participate on equal footing with their more courageous brethren who have stayed above ground and have successfully faced the bad weather. But will they?

Mother Nature has ruled that the hibernators must live on berries, nuts, or "what have you" in the way of left-overs. But the lion sits down to a dinner of venison steak.

Being curled up in a ball underground may develop an appetite, but it does not develop the qualities for competition.

There are lions, and ground hogs as well, in every industry. But unlike their animal prototypes there is but one kind of food that all must eat, or else starve. It is profits.

Our industrial lions have been spending to save. They have not permitted their advertising muscles to become flabby, nor have they lost their cunning in the strategy of sales approach. Their teeth have been kept sound through constant gnawing at the tough fibres of "overhead" and their competitive claws have been sharpened by intensive cost reduction and intelligent replacement of equipment.

By and by the sun will shine once more and the business ground hogs will come out of their holes.

Can they compete with the lions?

By
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The Iron Age

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Previous recent editorials on the subject of replacement:

"Machinery Needs a Friend," The Iron Age, March 12, 1931.
"Depressions Uncover Obsolescence," The Iron Age, March 19, 1931.
"One Word Costs Billions," The Iron Age, April 9, 1931.
"How to Win This War," The Iron Age, April 16, 1931.
"How Bankers Regard Equipment Loans," The Iron Age, April 23, 1931.
"To Him Who Hath," The Iron Age, April 30, 1931.
"Who Pays For New Equipment?" The Iron Age, May 7, 1931.

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AUTOMOTIVE PEAK THIS MONTH

EXCEPT for some unforeseen upset, May assemblies of motor cars will set a monthly peak for the first half of 1931 at 370,000 units. June will probably bring a seasonal recession. Fewer model changes in midsummer will benefit the makers by stabilizing the sales curve.

Next important movement in the automotive industry will probably result from the present expansion in the bus and truck fields now going on among a number of car makers.

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NEW BUSINESS INDEX

AMERICAN Gear Manufacturers' Association has established a gear business index, issued monthly in chart form. It is based on dollar values.

Gears being an essential part of nearly all machinery, industrial, automotive and railway, the rate of orders for gears should be an excellent indicator of general industrial activity.

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FIRST QUARTER PROFITS

NATIONAL City Bank, New York, analyzes first quarter statements of some 200 industrial corporations, finding net down 49 per cent from 1930 and 62 per cent from 1929. Annual rate of return of 10.7 per cent in 1930 is now reduced to 5.3 per cent for the group which represents a diversified list of industries.

Petroleum heads the list of profit losers, showing a profit retraction of 100 per cent. Next comes textile products, with a 90 per cent profit shrinkage. Iron and steel come third, with a shrinkage of return from 7.3 per cent in the first quarter of 1930 to 1 per cent in the current year, or an 85.3 per cent drop.

At the favorable end of the line is food products, with a shrinkage of but 4.4 per cent from 1930 performance.

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REDUCING

CONSENSUS of foreign opinion, as expressed at the International Chamber of Commerce meeting, seems to be that Uncle Sam needs to take reducing exercises. Reduce tariffs, reduce wages, reduce war debts! But Secretary Mellon countered with the argument that it is better to be fat and happy than thin and beautiful. "Our standard of living must be preserved at all costs," he declared. And President Hoover suggests some military reducing abroad.

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UNEMPLOYMENT

GERARD SWOPE, president, General Electric Co., discussed employment regularization last Wednesday at the International Chamber of Commerce meeting. He believes that each industry or trade will eventually underwrite its own unemployment insurance in the form of product prices, just as they now include in prices such items as the elimination of industrial hazards. He believes that if this were effected the stimulation and reassurance of the worker would result in lower costs and thus eventually penalize neither the employer nor the buyer of the goods.

Certainly this is a much sounder way to approach the problem of the idle but willing worker than through either charity or taxation.

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IMMIGRATION DOWN

LESS than 100,000 aliens will take up their permanent abode with us during this calendar year, according to the United States Immigration Bureau. The doors are being padlocked by means of discretionary powers afforded through our new consular policy.

Only during one year, since 1845, has there been such a small influx. The average annual immigration from 1905 to 1914 was close to one million. Now it is down 90 per cent.

This is of interest to the builders of cost-reducing machinery, inasmuch as the present drastic curtailment is said to represent future as well as present policy.

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MOVING UP

COMPANY executives today are taking a more active part in the selection of industrial equipment than for many years past. This was evident to many exhibitors at the American Foundrymen's Association meeting last week in Chicago. The attendance indicated that principals are not delegating to subordinates either attendance at such meetings, or the power to buy as they did in easier times. Selection of industrial equipment is moving up. Today, it is the executive who must be sold.

Also, it is evident that those who attended the exposition had the power to buy, for a canvass of exhibitors revealed a rather surprising amount of sales.

Canadian Steel Business May Be Partly Diverted to England

British Steel Export Association Seeks Inter-Empire Agreement to Secure Dominion Trade

TORONTO, May 12.—Julian J. Piggott, manager of the British Steel Export Association, is on a mission to Canada for the purpose of interesting leading iron and steel producers of this country in a plan for increasing trade and business with Great Britain. The proposal outlined by Mr. Piggott, and in connection with which negotiations are now in progress, would protect Canadian producers from price-cutting by British manufacturers in the sizes and shapes of structural and other steel that Canadian mills are capable of producing and the diversion to British steel plants of business in larger sizes and shapes now imported from the United States.

The companies said to have been approached by Mr. Piggott for cooperation with the British steel industry are: Algoma Steel Corpn., Sault Ste. Marie; Steel Co. of Canada, Ltd.; Dominion Foundries & Steel Corpn., Hamilton, Ont., and the Dominion Steel & Coal Co., Sydney, N. S.

The proposed inter-empire arrangement, together with the recently increased tariff rates on certain steel products imposed by the Canadian Government, is expected to have far-reaching effect in building up trade between Canada and Great Britain. An indication of the effect the action will have is revealed in the arrival this week of 1000 tons of steel plate at the Toronto terminal warehouse. This marks the first step in trade negotiations between Canada and England, whereby the latter country may secure fully one-half of Toronto's steel business. The first shipment is confined to the Toronto Iron Works, and another shipment of 1000 tons is expected later this month.

Alexander Dawson, manager of the Toronto Iron Works, stated that British steel is cheaper than steel from other sources, but a large quantity of raw steel will still have to be purchased in the United States, owing to the fact that some customers of local construction companies require work done too quickly to permit of the material being shipped from England. About 50 per cent of the contracts, however, allow sufficient time for the steel to be brought across the ocean.

According to statements by local steel interests, the proposed scheme is favorably received, and it is believed that within a few months' time considerable buying that was formerly done in the United States will be turned to the English markets.

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Steel Jobbers to Meet in Pittsburgh May 18-20

The twenty-second annual convention of the American Steel and Heavy Hardware Association will be held at the William Penn Hotel, Pittsburgh, on May 18, 19 and 20. The morning session on May 18 will be addressed by George S. Case, president, Lamson & Sessions Co., Cleveland, on "What Manufacturers Are Doing to Reduce Expenses and Improve Service." This will be followed by an address by L. H. Burnett, vice-president, Carnegie Steel Co., Pittsburgh, on "Industrial Pittsburgh." The afternoon meeting will include an address, entitled "Business for Profit," by Dr. Frank M. Surface, assistant director, Bureau of Foreign and Domestic Commerce. The morning of May 19 will be devoted to questions on plates, structural and sheet steel. The first discussion will cover the question, "What Troublesome Problems Confront Our Members Distributing Hot-Rolled Steel?" "The Merchandising of Steel" will be the topic of an address by G. F. Ahlbrandt, general manager of sales, American Rolling Mill Co., and the concluding talk will be presented by Dennis A. Merriman, vice-president and general manager of sales, American Steel & Wire Co., Chicago, on "Present Tendencies in the Distribution of Steel Products."

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Some Districts Showed April Building Gains

A few bright spots on the April building map are pointed out by the F. W. Dodge Corpn., New York, in connection with the announcement of a general total of new construction contracts for the month, which is below that of April, 1930. Three of the 13 Dodge territories, comprising the 37 States east of the Rockies, showed gains in April construction totals over April, 1930.

Of the month's $336,925,200 total for all types of new construction, the upstate New York territory registered a gain with its $22,358,700 total; Central Northwest went ahead with $14,048,000; and the New Orleans district carried a gain over last year of $1,414,900 in its $7,791,900 total.

The April record of contracts awarded divided its total among the three major construction classes as follows: $95,896,400 in residential building; $108,035,600 in non-residential; and $132,993,200 in public works and utilities.

Residential building showed a go-ahead in the Metropolitan New York and Central Northwest districts. The Metropolitan New York total in this class was $34,873,900, compared with $26,550,700 in April last year. The Central Northwest gain was slight, with $2,061,500 in the past month, compared with $2,034,900 last year.

Both upstate New York and New Orleans territories produced larger totals in non-residential work and in engineering projects than in April, 1930. For non-residential building, the New Orleans district was alone of the 13 to show a gain over 1930 for the first four months of the year.

Gains in civil engineering for the first four months of 1931 are reported by the New England, upstate New York, Central Northwest, Texas and New Orleans districts.

A gain over March of 2 per cent in residential awards on a floor space basis contributes an optimistic note, although this gain is somewhat under the usual seasonal 4 per cent.

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Name Electric Welding Apparatus Committee

F. M. Farmer, Electrical Testing Laboratories, New York, representing the American Institute of Electrical Engineers and the American Welding Society, has been appointed chairman of the American Standards Association's sectional committee on electric welding apparatus.

The committee will work on the formulation of standards for electric welding apparatus, including definitions of terms, classification, rating, heating, efficiency, testing methods, dielectric test, standard values of current and voltage and name-plate data. The work will be based on the standards submitted by the American Institute of Electrical Engineers relating to electric arc and resistance welding apparatus. The National Electrical Manufacturers Association is joint sponsor for the project with the American Institute of Electrical Engineers.

The committee's personnel includes representatives of the American Bureau of Shipping, American Electric Railway Association, American Institute of Steel Construction, American Railway Association, American Society of Mechanical Engineers, American Welding Society, National Electric Light Association, National Electrical Manufacturers Association and the Society of Automotive Engineers.

May Automobile Output May Total 370,000 Units, a Gain Over April

DETROIT, May 11.

AUTOMOBILE production in the United States and the Dominion, at 348,909 units, reached in April the highest level in 10 months, according to the estimate of the National Automobile Chamber of Commerce. The gain over March was 21 per cent, whereas last year it amounted to 12 per cent. Output in the first four months of 1931 was 1,046,399 units, contrasted with 1,537,588 in the same months of 1930.

Unless there is an unexpected reversal of present plans on the part of the industry, May assemblies will total at least 370,000 cars and trucks, with a possibility that the 380,000 mark will be attained. This will put the current month's production as the peak for the year thus far. Earlier it was believed that the highest manufacturing point of the first half might not be reached until June, but the failure of business to throw off its lethargy is bound to affect retail automobile sales and to prevent maintenance of the present operating rate beyond the current month.

Nevertheless, the feeling in certain circles that the end of May will see a radical slump in output is not representative of the opinion held by automotive executives. Although it is admitted that June will bring a recession, assemblies next month should be well over 300,000 units and probably will be 325,000 to 330,000. Those whose fingers are on the public's pulse are convinced that the summer sales curve will be somewhat lower than in April and May, but will flatten out and remain pretty well fixed through June, July and August. The industry will benefit from fewer model changes in midsummer and from buyers who have waited longer than usual to purchase new cars.

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With production expected to be 370,000 cars, May will be the peak month for automobile production so far this year. June should be 325,000-car month.

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Motor car production in 1931 now estimated at 3,300,000 units, a drop of 200,000 units from last year.

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Chrysler has announced five new deluxe body styles in its straight-eight line. DeSoto is offering three new models to round out its line. Graham-Paige is now showing its much-heralded "Prosperity Six."

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April automobile output in United States and the Dominion estimated at 348,909 units by National Automobile Chamber of Commerce. Total for first four months of 1931 was 1,046,399 units contrasted with 1,537,588 in same months of 1930.

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It seems reasonable to predict that the first half of 1931 will show a total production of more than 1,700,000 units, compared with 2,330,233 in the first six months of last year. This means that in order to equal its 1930 performance the industry must make more cars and trucks in the last half than in the first half. Most observers are somewhat skeptical of its ability to achieve this goal, and place the year's output at about 3,300,000 units. This is a rather sharp scaling down from the 4,000,000 units which automobile companies a few months ago confidently expected to manufacture this year.

Ford's Output a Surprise

AT the moment Ford is an enigma to the industry. There have been numerous stories regarding an eight-cylinder car, but the fact remains that these tales are based on mere hearsay. Detroit is somewhat weary of further discussion of a so-called Ford eight, at least until some tangible, authoritative evidence appears establishing such a car as a reality. Meanwhile, Ford surprised the trade by making 117,891 units in April, when an output far under that figure was anticipated. Although suppliers are talking about curtailment in Ford's operations, it will be surprising if May shows more than a slight decline from April. In fact, this month may see assemblies boosted to 125,000 units.

Chevrolet probably will exceed its April record, and at present is working on a schedule which calls for 110,000 units this month. Inasmuch as the Ford and Chevrolet programs apparently do not specify much expansion above recent levels, a substantial part of any gain shown this month over April will originate in the medium-priced group. The Chrysler-owned companies have stepped up production somewhat, while Oakland-Pontiac has 14,000 cars planned for May. Oldsmobile, Studebaker, Nash and Buick have shown an encouraging upward turn; Willys-Overland, on the other hand, has revised its activities downward. The new DeVaux six is supposed to come off the assembly line at the rate of about 1000 a week, but it is doubtful whether the company will get up to that number in May. Auburn is turning out over 6000 cars monthly. It is about ready to begin the manufacture of the

regular sedan and brougham body types at its Auburn, Ind., plant whereas these types heretofore have been made exclusively at Connersville.

Many New Car Offerings

THERE is no end to new car offerings. Chrysler is this week announcing the addition of five deluxe body styles to its straight eight line. Patterned after the Imperial eight in appearance, these models range in price at the factory from $1,525 for the coupe to $1,970 for the phaeton. They are powered by 95-hp. engines and are featured by distinctive interior appointments. Aluminum alloy pistons of the Iso-therm steel strut type are used. The four-wheel hydraulic brakes have an improved brake drum with a special alloy rim, which dissipates heat more rapidly than steel, contacting with brake shoes. New Oilite bronze bushings are employed at the rear ends. Overall length from bumper to bumper is 188 in. and overall height 68 in. Five wire wheels are standard equipment with wood wheels optional. The bodies are of welded steel, one-piece construction.

DeSoto, a Chrysler subsidiary, had an advance showing in this city the past week of three new models to supplement its present line. It is offering a six-cylinder, two-door sedan at $715, f.o.b. factory, the lowest-priced six ever built by the company, a deluxe six sedan at $820, and a deluxe eight sedan at $995. The much-heralded "Prosperity Six," product of Graham-Paige Motors Corpn., was revealed to the motor world yesterday. Peerless is working on some mechanical changes to be announced shortly. Packard and Nash are understood to be preparing new models for early introduction. The American Austin has put a price of $330 on its business coupe and is expanding its line to include six body types.

New Tests for Diesel Engines

THE Packard Motor Car Co. is continuing its experiments in developing the Packard Diesel airplane engine and contemplates in the near future another non-refueling endurance flight in a plane powered by a new motor. In connection with these experiments, the company is exploring the full field of the potential uses to which fuel oil engines may be adapted, such as power unit in motor trucks, marine engines and stationary engines. It is interesting to note that C. L. Cummins, president of the Cummins Engine Co., Columbus, Ind., has entered a Diesel-engined car in the international 500-mile race at Indianapolis on Memorial Day. The purpose is not to try to win the race, but to see how this type of engine will stand up under such a grueling test. Mr. Cummins recently drove a standard marine Diesel engine mounted in an automobile chassis at a speed greater than 100 miles an hour under official A.A.A. timing at Daytona Beach, Fla. The automobile and four-cylinder engine were assembled at Columbus and on the round trip to Florida ran 2880 miles with a total fuel oil consumption of 85 gal., costing $6.80. Mr. Cummins does not now manufacture automotive Diesel engines, but in a year or two may produce them for truck, bus and tractor service.

The Diesel engine principle in the automotive industry, states Prof. Walter E. Lay, automotive expert in the College of Engineering of the University of Michigan, embodies such marked advantages in simplicity and economy that it cannot be disregarded. Due to high pressures and excessive weights in the Diesel, however, it is probable that the eventual form will be a combination of the good features of the gasoline engine and the heavy oil burner. This will originate in the truck and bus field, where economy is imperative. Professor Lay points out that modified Diesel trucks are already being built by a British firm.

Foundry Situation Improving

THERE has been some improvement in the foundry situation in southern Michigan. The most active foundry is Chevrolet's at Saginaw, which is said to be pouring 1600 tons of iron a day. Buick and Oakland-Pontiac are fairly busy, while Dodge likewise is going fairly well. Two important foundries at Muskegon have stepped up operations. Cadillac is running at a satisfactory rate; Packard also is moderately engaged. Hanna Furnace Corpn. blew in its second blast furnace at Zug Island on April 30, producing merchant iron. The entire output of the first furnace is being taken in the form of hot metal by the open-hearth furnaces of the Great Lakes Steel Corpn. Charles E. Thompson, president of Thompson Products, Inc., Detroit, reports that truck and bus building will feature the next important move in the automotive industry. Apparently leading automobile manufacturers are in agreement on this question in view of their recent expansion in the truck and bus fields. Included in this group are Ford, Chevrolet, Chrysler, Willys-Overland, Studebaker, Pierce-Arrow and Reo.

Graham-Paige has followed the lead of other American manufacturers in establishing production facilities in Canada. Its plant will be at Walkerville. Parts makers are following their customers in this move, the newest recruit being the Gemmer Mfg. Co., steering gear manufacturer. Its factory will also be in Walkerville.

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Open-Hearth Men Meet in Chicago

CHICAGO, May 12.—About 100 operating men and others were present this morning at the opening session of the semi-annual open-hearth conference. This meeting, held in the Hotel Stevens, is sponsored by the iron and steel division of the American Institute of Mining and Metallurgical Engineers. It is under the chairmanship of Leo F. Reinartz, works manager, Middletown plant, American Rolling Mill Co.

Five topics, the discussion of each being led by one of the members of the committee, were covered in the morning session. These included: Furnace construction, led by G. D. Tranter, and centered on the cause and cure for plugged-up checkers; refractories, led by F. K. Buchanan, and dealing particularly with the insulation of old checker chambers; organization, led by H. B. Hubbard, and centering on the question of safety in a steel plant; auxiliary open-hearth equipment, led by F. B. McKune, dealing with dampers of alloy steel, handling of hot metal and use of waste-heat boilers; pit practice, led by Kenneth C. McCutcheon.

In the afternoon a visit was made to the South Works of the Illinois Steel Co. at South Chicago. Here the large new open-hearth installation was inspected in great detail, with the object of discussing it at the morning meeting on Wednesday.

The meeting continued through Wednesday with both morning and afternoon meetings. The topics for the morning include combustion control, steel melting, control of quality in killed steel, and a progress report on special work done by Dr. C. H. Herty, Jr., of the United States Bureau of Mines. In the afternoon the topics included the control of quality for rimming steel and whatever overflow of discussion results from inability to cover fully the topics assigned to previous sessions.

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Further Rise in Factory Wages

Average weekly earnings in factories in New York State in March were $27.96, according to a report of the State Industrial Commissioner. This is the highest figure since last October, when $28.03 was registered. It represents an increase of 52c. over the February figure and of 95c. over that for January. Compared with March, 1930, however, there has been a drop of almost $2, and the March figure is the lowest for that month since 1923.

Corporation's Unfilled Orders Lower

A seasonal decline in unfilled orders of the United States Steel Corpn. leaves the total, April 30, at 3,897,729 tons. The drop from March 31 was 97,601 tons, or less than half the average drop between March 31 and April 30 (261,000 tons) over the 10 preceding years. In those 10 years increases have been registered only in 1922 and 1929, the latter having been only 17,000 tons.

At the April 30 level, orders are about 500,000 tons lower than in 1930 or 1929 at the same date. There has been a decline since the end of January amounting to 235,000 tons, or 5.5 per cent of the total at that recent peak. The January level was the highest since that for April 30, 1930.

Unfilled tonnage at the end of each month for the past two years follows:

	1931	1930	1929
January	4,132,351	4,468,710	4,109,487
February	3,965,194	4,479,748	4,144,341
March	3,995,330	4,570,653	4,410,718
April	3,897,729	4,354,220	4,427,763
May	.....	4,059,227	4,304,167
June	.....	3,968,064	4,256,910
July	.....	4,022,055	4,088,177
August	.....	3,580,204	3,658,211
September	.....	3,424,338	3,902,581
October	.....	3,481,763	4,086,562
November	.....	3,639,636	4,125,345
December	.....	3,943,596	4,417,193

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Says Wage Differences Must Be Adjusted

The outstanding barrier to a recovery from our present economic depression, says W. J. Buttfield, president, Vulcan Detinning Co., Sewaren, N. J., is "the existing gross inequality in the exchangeable value of one man's work for that of another." He made this observation in addressing the annual meeting of the stockholders of the company.

"While no reductions have been made in hourly wages," said he, "there has been weeding out of laggard workers. So long as employees decrease unit costs by increased energy, it would seem unwise to discourage their efforts. This is especially true of factory workers receiving wages widely disproportionate to the scale demanded by certain classes of organized labor for equal or less accomplishment. Furthermore, the purchasing power of the masses can only be sustained by a fair equality in wages for equal willingness and ability to create wealth.

"The problem of the future is the readjustment of exchangeable values of goods and services; for instance, 2½ years' work is now required from the man in the clay pits to purchase the equivalent of one year's work of the hod carrier.

"Whether wages as a whole are too high or too low is open to question. Services are entitled to a full fair share of the wealth created, but beyond this capital disappears and industry comes to a standstill.

"With a reasonable equalization in wages and a readjustment in production to give a balanced diet—less joy riding, fireworks and frenzied finance and more of things needed for a high standard of sane living—the door of prosperity, commensurate with each one's accomplishment, is open to all. There can be no such thing as overproduction of a balanced diet until we have a surfeit of all we need and desire."

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Mining Advisory Board To Continue Research

Continuation upon a somewhat restricted scale of the research activity of the Mining and Metallurgical Advisory Board to the United States Bureau of Mines and the Carnegie Institute of Technology of Pittsburgh was decided upon at a meeting of the board held in Pittsburgh on May 6. Following a résumé of work carried on during the board's five-year program, which comes to a close this year, the following resolution was adopted:

"The Metallurgical Advisory Board recommends that, in view of the restriction of facilities due to present conditions and withdrawal of support by the Bureau of Mines at the expiration of this year, our work be confined to the application in steel plants of the principles already worked out, with only such analytical or other laboratory work as may be essential to the interpretation of the results."

George Gordon Crawford, president, Jones & Laughlin Steel Corpn., told the board that manufacturers of steel are looking forward with interest to the day when they can base manufacturing operations on facts rather than on opinions. F. N. Speller, director of metallurgy and research for the National Tube Co., Pittsburgh, who presided at the meeting, pointed out that work done in recent years has stimulated laboratory men of steel plants throughout the country to greater accomplishments.

Definite information on the problems to be undertaken during the next year will be available at an early date. Plans are also being made for the fifth open meeting of the board, to be held in Pittsburgh on Oct. 16.

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Pittsburgh Foundrymen to Discuss Costs

Foundry standard costs will be discussed at a meeting of the Pittsburgh Foundrymen's Association at the Fort Pitt Hotel, Pittsburgh, on May 18. J. E. Currie, of the accounting department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, will be the principal speaker.

American Rolling Mill Names New Sheet Prices

The American Rolling Mill Co., Middletown, Ohio, on Tuesday announced the following new sheet prices to take effect under the new classification of grades that is now being put into effect:

	Per Lb., Pittsburgh
Hot-rolled sheets, No. 10 gage	1.70c.
Hot-rolled annealed sheets, No. 24 gage	2.40c.
Galvanized sheets, No. 24 gage	2.90c.
Long ternes, unassorted, No. 24 gage	3.15c.

Reclassification of sheets and the change in differentials have been extended to galvanized sheets and long terne stock on the following basis: No. 24 gage is base; for No. 23 gage, deduct 5c. per 100 lb.; No. 22 gage, deduct 10c.; No. 21 gage, deduct 15c.; No. 20 gage, deduct 20c.; No. 19 gage, deduct 25c.; No. 18 gage, deduct 30c.; No. 17 gage, deduct 35c.; No. 16 gage, deduct 40c.; No. 15 gage, deduct 45c.; No. 14 gage, deduct 50c.; No. 13 gage, deduct 55c.; No. 12 gage, deduct 60c.; No. 11 gage, deduct 65c.; No. 10 gage and heavier, deduct 70c.; for No. 25 gage, add 15c. per 100 lb.; No. 26 gage, add 25c.; No. 27 gage, add 35c.; No. 28 gage, add 50c.; No. 29 gage, add 75c.; No. 30 gage, add $1.

The above prices and differentials are effective immediately on new business and on third quarter bookings.

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Officers Elected by Southern Supply Ass'n.

The list of new officers of the Southern Supply and Machinery Distributers' Association, as published in THE IRON AGE of May 7, was incorrect. The following is the correct list of new officers:

President, Fred W. Glover, Textile Mill Supply Co., Charlotte, N. C.; first vice-president, W. M. Given, Young & Vann Supply Co., Birmingham; second vice-president, W. W. Taylor, Arkansas Mill Supply Co., Pine Bluff, Ark.; secretary-treasurer, Alvin M. Smith, Smith-Courtney Co., Richmond, Va.; Executive Committee: C. W. Beckner, West Virginia-Kentucky Hardware & Supply Co., Huntington, W. Va.; D. D. Peden, Peden Co., Houston, Tex.; L. D. Bailey, Rogers-Bailey Hardware Co., Chattanooga, Tenn.; T. W. Lewis, Lewis Supply Co., Memphis, Tenn.

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Wean Engineering Co., Inc., Warren, Ohio, has acquired exclusive license on a patented carloader, invented by William W. Leach, Mansfield, Ohio. The carloader is particularly adapted to the loading of sheet steel, coiled wire and rods in box cars, it being possible, it is said, to load these by the use of this loader into all four corners of the car.

▲▲▲ PERSONALS ▲▲▲

A. M. HARPER

W. P. SIEBERT

D. CROWLEY, JR.

ALBERT M. HARPER, whose appointment as assistant general manager of sales for the Carnegie Steel Co., Pittsburgh, was announced in THE IRON AGE last week, has been identified with the Carnegie company and its predecessors since 1888. He was born at Pittsburgh in 1875 and became identified with Carnegie, Phipps & Co. soon after leaving the public schools. He was made a clerk with the Carnegie Steel Co. on Jan. 1, 1895, and in 1905 was made manager of sales in the Pittsburgh district, a position he held until his recent promotion.

WILLIAM P. SIEBERT, whom Mr. Harper succeeds, has been identified with the steel industry for more than 50 years. He was born at Pittsburgh in 1859, and began his business career in the maintenance of way department of the Pennsylvania Railroad in 1877. He went with the McConway & Torley Co., Pittsburgh, in 1880, and later with the old Park Steel Co. as general sales manager and Denver, Colo., representative. From 1896 to 1898 he served as general manager of sales for the old Ohio Steel Co., leaving that position to join the old National Steel Co. in a similar capacity, where he remained until 1901, when the United States Steel Corpn. was organized. He has served as assistant general manager of sales in the rail and billet bureau for the Carnegie Steel Co. since that time.

DENNIS CROWLEY, JR., who succeeds Mr. Harper as Pittsburgh district manager of sales, previously held a similar position in New Orleans. He was born in Ireland in 1877, but at an early age removed to Pittsburgh and attended school in that city. He entered the commercial agent's office of the Southern Pacific Railroad at Pittsburgh in 1894, and joined the Carnegie company in 1901 as rate and route clerk in the traffic department. He soon was transferred to the sales department, where he has remained since that time. A. H. WARREN, JR., has been appointed manager of sales in the St. Paul, Minn., district for the Carnegie company, succeeding WILLIAM J. TOTTEN, who has retired.

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J. K. AIMER has been appointed assistant general manager of sales of the Reading Iron Co., with offices at 230 Park Avenue, New York. W. S. SHIFFER has been made assistant to the general manager of sales. R. I. FRETZ, of the Reading district, has been placed in charge of the Pittsburgh district, succeeding WYMAN HOWELLS, who has been transferred to the Reading territory. Other appointments include HARRY L. BIALOCK, St. Louis; L. C. HARTZELL, Reading, promotion of nipple business; GEORGE D. SMITH, railroad salesman, New York, and E. S. MOOREHEAD, Pittsburgh.

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CLAY P. HELLWIG has been appointed Cleveland district manager of Kerchner, Marshall & Co., Pittsburgh, dealers in pig iron, coal, coke, ferromanganese, alloys and kindred lines, who will open an office in Cleveland on June 1 at 627 Union Trust Building. Mr. Hellwig has been connected with the Cleveland office of Rogers Brown & Crocker Brothers, Inc., and its predecessor for 15 years and has recently been both Cleveland and Pittsburgh district manager for that company. The Rogers Brown, Crocker organization will discontinue its Cleveland and other Western offices May 31 and the products to be sold by Kerchner, Marshall & Co. are virtually identical with those handled by Rogers Brown & Crocker Brothers.

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W. S. THOMPSON, who has been identified with the New York office of the Ohio Seamless Tube Co., Shelby, Ohio, has been appointed Eastern sales representative, succeeding J. P. HILANDS, who has severed his connection with the company.

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FRANK M. GERMANE, for the past five years president of the Bearings Co. of America, Lancaster, Pa., has become special sales representative of the Budd Wheel Co., with headquarters in Detroit. BURTON W. BRODT, who has been sales manager of the Firestone Steel Products Co., has joined the sales staff of the Budd Company.

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C. N. OSBORNE, secretary and treasurer of the M. A. Hanna Co., has been elected a director of the National Steel Corpn., succeeding the late C. A. COLLINS.

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R. C. ROLFING, vice-president and general works manager for the Oliver Farm Equipment Co., Charles City, Iowa, has resigned and left last week for a month's trip to California. Mr. Rolfing was identified with the Hart-Parr company 20 years, first as works manager. When that company was merged with the Oliver company, he was made vice-president and general works manager.

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P. C. SAUERBREY has been appointed vice-president in charge of manufacturing of De Soto Motor Corpn., Detroit. He has been in charge of production at the De Soto-Plymouth plant in Detroit since its erection several years ago. He continues as vice-president in charge of manufacturing of Plymouth Motor Corpn. N. F. HADLEY has been made chief engineer of De Soto Motor Corpn., Detroit. He has been a member of the Chrysler engineering staff almost since its inception.

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EDWARD N. HURLEY, chairman of the board of Hurley & Co., and of the Electric Household Utilities Corpn., has been elected a director

of the Chamber of Commerce of the United States. Mr. Hurley was sponsored by the Illinois Manufacturers' Association, of which he is a past president.

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JOHN E. MORSE, of the transportation and carpentering division of the General Electric Co., West Lynn, Mass., after completing 43 years' service with the company, retired on May 4. He became associated with the Thomson-Houston Co. in 1888 as superintendent of construction, and in 1893 helped build the steel foundry at the River Works of the General Electric Co. Subsequently he was active in transforming this section from marshland into usable sites for other plant units.

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FRANK D. CHASE, president, Frank D. Chase, Inc., Chicago, was the guest of the New England Foundrymen's Association on May 13 at a meeting in Boston. Mr. Chase gave an illustrated talk on foundry engineering in the United States and in Russia.

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F. O. SCHNURE, president of the Association of Iron and Steel Electrical Engineers, Pittsburgh, will describe the work of that organization in a short talk during a salute to the iron and steel industry to be given by the Westinghouse Electric & Mfg. Co. in a radio program on Sunday evening, May 31.

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JAMES A. FARRELL, president, United States Steel Corpn., and chairman of the National Foreign Trade Council, will speak on international trade conditions in a radio program of the Westinghouse Electric & Mfg. Co., East Pittsburgh, on Sunday evening, May 24, instead of on May 26, as reported in a recent issue of THE IRON AGE.

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STRICKLAND KNEASS, JR., since November, 1928, chief engineer for the A. M. Byers Co., Pittsburgh, has resigned, effective May 1. Mr. Kneass was formerly chief engineer for the Costello Engineering Co., Pittsburgh, and prior to that served as steam engineer for the Youngstown Sheet & Tube Co., Youngstown.

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R. H. CREVOISIE, recently assistant chief engineer for the Republic Steel Corpn., Youngstown, has been made plant engineer at the new wrought iron plant of the A. M. Byers Co., at Economy, Pa.

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DR. FRITZ NEUHAUS, until recently general manager and chief engineer of A. Borsig, Berlin-Tegel, Germany, has established himself with offices at 200 Kaiserallee, Berlin, W 15, Germany, as consulting engineer and representative of American engineering equipment manufacturers. He served the Borsig works for over 30 years, which gave him an experience in power plant and general engineering construction in both Europe and the United States. Since 1917 he has been president of the German Engineering Standards Committee.

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JAMES E. JONES, formerly superintendent of the roll department, South Chicago works, Illinois Steel Co., whose contributions to roll and rolling mill design have been numerous, has become associated with the Continental Roll & Steel Foundry Co., Chicago. Mr. Jones, who retired on April 30, last, in accordance with the new pension plan of the United States Steel Corpn., takes with him to his new connection an experience in rolling mill work of 62 years, a period which covers the entire development of the American iron and steel rolling industry. He started with the Burden Iron Works Co., Troy, N. Y., in 1869. He left that company six years later to go with the Carnegie-Kloman Co., Pittsburgh. Five years with that company were followed by a connection lasting six years with the Pencoyd Iron Works, Philadelphia. In 1886, Mr. Jones joined the Colorado Fuel & Iron Co., Pueblo, Colo., where he remained until 1893, and then returned to the East to go with the Passaic Rolling Mill Co., Paterson, N. J. From 1900 until 1902 he was with the Dominion Iron & Steel Co., Sydney, N. S., and then for two years was with the Seaman-Sleeth Co. (Phoenix Roll Works), Pittsburgh. For a few months, in 1904, he was with Ferreria De Tula, Jalisco, Mexico. On Feb. 22, 1905, Mr. Jones became superintendent of the roll department, South Chicago works, Illinois Steel Co., and held that position until his recent retirement.

J. E. JONES

S. M. KINTNER

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S. M. KINTNER, who has been assistant vice-president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, was elected vice-president in charge of engineering at a recent meeting of the board of directors. He succeeds W. S. RUGG, who has been elected vice-president in charge of sales. Dr. Kintner was graduated from Purdue University, where he studied electrical engineering, in 1894. After spending a year on telephone construction and operation, he became assistant to Professor Fessenden at the Western University of Pennsylvania, now the University of Pittsburgh, where he continued for over two years. He then was made assistant professor of mathematics and later professor of engineering, succeeding Professor Fessenden. He remained professor of engineering for three years, resigning in 1903 to go into the research department of the Westinghouse company. After four years of study in connection with high-tension phenomena, alternating current, electrolysis, telephone interference and motor flashing troubles, he was made design engineer in charge of alternating current railroad motor design and was responsible for the design of the motors employed on the New Haven Railway, St. Clair Tunnel, and many other important installations. In 1911 he resigned from the Westinghouse company to become general manager of the National Signaling Co. Later he became vice-president and finally president of that organization. During the war this company made much radio apparatus for the Navy and Signal Corps. Following the war, he negotiated a sale to the Westinghouse company of the patent rights of his company. After spending approximately two years with the Westinghouse company in radio development, he was appointed manager of the research department, and on April 16, 1930, he was elected assistant vice-president in charge of the engineering activities of the company. On June 11, 1930, the University of Pittsburgh conferred upon him the honorary degree of doctor of science.

OBITUARY

HARRY D. CUSHMAN, president, Ferro Enameling Co., Cleveland, died after a brief illness May 6, aged 57 years. He was born in Three Rivers, Mich., and, after his graduation from Albion College, located in Cleveland in 1897. After several years' activity in the steel industry he became interested in the development of the porcelain enamel field and through his activities the Ferro Enameling Co. was established in Cleveland in 1919 for the manufacture of prepared frits and liquid enamel. Realizing the necessity for scientific control of manufacture and raw materials, he devoted for a considerable period a large part of his time to the organizing and equipping of laboratory control of enamel products. Through his contribution along these lines he is credited with having done much to advance the porcelain enamel manufacturing industry.

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SAMUEL F. KALLENBAUGH, sales manager, Morgan Engineering Co., Alliance, Ohio, died suddenly May 8, aged 62 years. He had been connected with the company for 35 years.

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CHARLES B. BURLEIGH, who retired from the General Electric Co. last September, after serving that company and its predecessor companies 46 years, died at his home in Malden, Mass., May 6. Mr. Burleigh was born in Chelsea, Mass., in 1862. Early in life he became associated with telephone companies in Chelsea and Minneapolis and in 1884 was placed in charge of power plant construction by the Thomson-Houston Co., Lynn. He then was made superintendent of the isolated lighting department. When that company was consolidated with the General Electric Co., he became commercial engineer, and eventually New England district manager of the central station department.

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CHARLES S. HEBARD, president of the International Boiler Works Co., East Stroudsburg, Pa., died on May 5.

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GEORGE H. LEIDIGER, of the Northwestern Malleable Iron Co., Milwaukee, died at Columbia Hospital on May 5, after a short illness. He was a lifelong resident of Wisconsin, having been born in Clark County 46 years ago.

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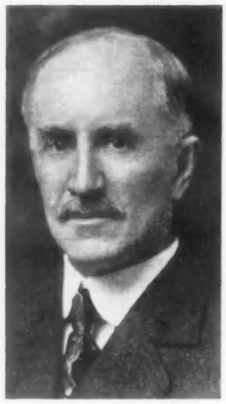
RONALD E. PARMENTER, general branch manager, Heil Co., Milwaukee, manufacturer of steel dump bodies, other motor truck equipment and hydraulic hoists, died May 1, after an illness of several months. He was born in Chilton, Wis., June 21, 1892, and was a graduate of Carroll College, Waukesha, Wis. He joined the Heil Co. four years ago.



JAMES N. HEALD

JAMES N. HEALD, president and general manager of the Heald Machine Co., Worcester, Mass., died at his home in that city on May 6. He had been in poor health for several years. His death was due to a heart affliction. Mr. Heald was born at Barre, Mass., Sept. 21, 1864. He graduated from the Worcester Polytechnic Institute with the degree of bachelor of science in 1884. Immediately after graduation he entered the family business at Barre. The house was established in 1826 by Stephen Heald. His little shop did machine jobbing and later produced agricultural and wire-drawing machinery. Stephen Heald's son, Leander, was taken in the partnership as S. Heald & Son, and when James joined the business both grandfather and father were still running it. Stephen Heald died in 1888, and the firm became L. S. Heald & Son, and James N. Heald took over the management. It was then the real growth of the business had its beginning.

James Heald made many changes in the business. He was regarded as a pioneer in modernizing the grinding machine. He first developed a line of drill and center grinders. He believed that grinding was the secret of the future's mechanical development and applied himself to the difficult problems of internal grinding. He wanted to grind a hole round and straight within very narrow limits of precision, quickly and cheaply, in what today we know as mass production. In 1903 he bought his father's interest in the firm and organized the Heald Machine Co., transferring the business to a Worcester factory, which was the nucleus of the present large plant. The beginning of the Heald internal grinding machine was coincident with the new location. The first machine was the ring and surface grinder for the automobile industry. Then followed the line of internal grinders for mass production, with revolutionary reduction in manufacturing costs. In succeeding years these lines were highly developed and amplified, always under the immediate supervision of Mr. Heald.

At the time of his death, Mr. Heald was president and general manager of the company, but had turned over many of the duties of management to his sons. Roger N. Heald is vice-president and works manager and Richard A. Heald is secretary and treasurer.

Mr. Heald was for many years a member of the National Machine Tool Builders' Association, and served as its treasurer and for three years on its board of directors. He was also a member of the American Society of Mechanical Engineers.

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WILLIAM A. LONG, who has been associated since 1925 with the Pratt & Whitney Co., Hartford, Conn., and who was known in the manufacturing industries as "Billy," died at the Providence Hospital, Providence, R. I., May 3, aged 60 years. For the past 36 years he had specialized in the cutting and finishing of gears. During these years he had been identified with the Brown & Sharpe Mfg. Co., Barber-Colman Co., Pierce Arrow Co., and Franklin Motor Car Co.

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CHARLES DAY, chairman of the board of Day & Zimmermann, Inc., Philadelphia, died after an illness of two weeks at the University Hospital in that city, May 10, aged 52 years. He was graduated as a mechanical engineer from the University of Pennsylvania in 1899 and received further training in an engineering corporation in Nicetown. Mr. Day then went into business for himself, organizing the engineering firm of Dodge & Day, which later became Day & Zimmermann. He was made president in 1916 and chairman of the board 10 years later. During the war Mr. Day was engineering advisor to Colonel House.

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SAMUEL HEPPENSTALL, organizer of the Heppenstall Co., Pittsburgh, died on May 11 at his home in Bala, Pa., where he had lived since his retirement several years ago. He was born in England 88 years ago and came to this country in 1867, where he entered the employ of Henry Disston & Sons Co., Philadelphia. Going to Pittsburgh in 1877, he worked for a time with Howe Brown Co. and four years later purchased an interest in the Trethewey Mfg. Co., which he organized as the Heppenstall Forge & Knife Co. He served as president of this company from 1898 until 1920, when he retired to become chairman of the board.

Pig Iron Output Out of Line with Steel

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

PROBABLY the most striking, and at the same time one of the most significant, of recent developments in the iron and steel industry is the divergence between production of pig iron and of steel ingots. In April, pig iron pushed ahead and ingot output was considerably reduced. As a result, current additions to the supply of pig iron became distinctly out of line, for the first time since last December. This development is likely to accentuate weakness in pig iron markets during the next few weeks.

Conditions in the industry continue to shape up somewhat as in the first half of 1921. We have previously suggested that the late price manoeuver resembled the moves made in May, 1921. Now, in the relative positions of iron and steel production, we find some resemblance to June, 1921. Nor is it entirely reassuring to add that the greater magnitude of the premature expansion in production this year, and the more prolonged existence of a relatively high pig iron output, suggest the possibility that at least as much curtailment will be required as in the mid-1921 period.

On the basis of the average daily ingot output in April, we estimate that production was 61.6 per cent of "normal," which compares with 64.8 per cent in March. Thus a more-than-seasonal decline occurred. Of course, the computation of long-time trend tends to make the estimated normal level very high in comparison with present production.

Pig iron production in April was 64 per cent of "normal," against 62.7 per cent in March, an increase of more-than-seasonal proportions. Nor was the pig iron output so far below normal as in the case of steel. It is not surprising to read of accumulation of stocks of pig iron in some areas.

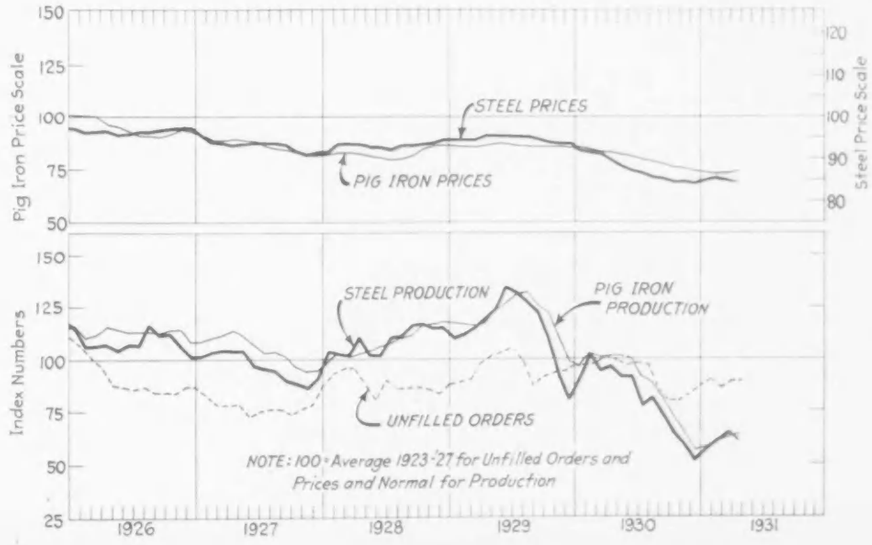
In line with preceding developments, the average price of finished steel has shown weakness and steel scrap has continued to decline, while the pig iron markets have on the whole held firm. The pig iron price average in April was slightly above that in March.

One of the results is bound to be an increased substitution of scrap for pig iron; indeed, a trend in this direction is already apparent. This strengthens the opinon that, in spite of the already low level of pig iron prices, some further decline may occur.

Supplies of steel scrap are evidently large. With a general lower level of demand for steel resulting in curtailed production, and with the weakness of the pig iron market, no strength in scrap prices is yet in sight. Perhaps, before July is over, seasonal forces combined with the use of an increased percentage of scrap in steel-making may bring an upturn.

The last traces of the late advance in finished steel prices are disappearing. The advance might conceivably have held had steel production been kept down, but expansion of output at a time when the general level of commodity prices was declining made it impossible. It still seems that the markets for iron and steel are not likely to reach their final levels until they come to be really "tested" by a larger volume of buying.

That this level may not be so much lower as some fear is suggested by the fairly satisfactory showing made by unfilled orders at the end of April. The decline of 97,600 tons was less than seasonal, and therefore at least allows hope that the demand for steel may be in better balance with supply than trade reports might indicate.



Pig iron production is again too high in comparison with steel. Prices may be weaker for pig iron, for a month or more. But the unfilled order curve lends hope for early stabilization in steel prices.

W. W. MACON
Editor

..THE IRON AGE..

A. I. FINDLEY
Editor Emeritus

(ESTABLISHED 1855)

Find No Easy Way Out

THE meeting of the International Chamber of Commerce at Washington last week saw a more thorough threshing out of economic problems than occurred at the convention of the American Chamber at Atlantic City the week before. The frankness of discussion, the sharp divergences in viewpoints and, above all, the earnest desire of all delegates to contribute constructively to the alleviation of depression ills made the world conference a lesson in the growing interdependence of nations.

The opinions of individual speakers were naturally colored by their particular national backgrounds, and it is not surprising that representatives of the Old World found themselves opposed to spokesmen for the New World on a number of issues, notably wages and tariffs.

The industrial nations of Western Europe measure prosperity in terms of exports. To them high labor costs and tariff walls are handicaps in the struggle for world trade. In this country, on the other hand, the greatest prosperity ever experienced came with the intensive cultivation of mass consumption within our own borders. As Secretary Mellon pointed out, our high standard of living is part and parcel of the large-scale operations to which our plants are geared. He, like most Americans, is skeptical of the wisdom of radical changes in our economic policy, and particularly any moves that would permanently lower the buying power of our domestic market.

Lowering real wages would make the United States a more serious competitor in foreign markets, accentuating competition in an already crowded field. Sharp downward revision of our import duties would let loose a flood of European goods, which, initially at least, would further depress domestic plant production, at the same time greatly increasing present difficulties in providing employment for our workers.

Between the American and European points of view there must be some middle ground, because world trade implies exchange and debtor nations must be given an opportunity in some manner, direct or indirect, to discharge their indebtedness in terms of goods. Undoubtedly the examination of the tariff and wage problems in their many ramifications and from a world perspective has done much to nullify intemperate, dogmatic and provincial arguments and to lead the way toward sane, sound and thoroughly considered policies.

Aside from these subjects and the relation of international debts to world recovery, a political issue, there was more general agreement in the ideas expressed, especially in diagnoses of the causes of the depression. The parts played by securities speculation, by overstimulation of consumption, by overextension of capacity and its sequel, overproduction, and by the demonetization of silver were all recognized.

But no remedies were proposed that savored of Sovietism. "National planned economy," a much used term among theorists, carries little appeal to practical men of affairs, since they distrust artificial inhibitions on individual initiative and can see how interference with plant expansion might do more harm than the surplus capacity to which it contributes. All schemes for restricting capacity are based on the hypothesis that all plants in a given field are substantially alike. Anyone close to industry knows that this is far from the truth. It is always possible to classify capacity as modern, semi-modern, obsolescent or obsolete. Who will decide what plants shall run and who will determine what improvements in equipment shall be made? Shall the enterprising, energetic and brainy management be barred from making innovations just because one of the results—and a common one—is an increase in capacity? No more effective way could be found for halting progress.

Without going into details, the attitude of the international chamber toward ideas of this sort was probably best expressed by its retiring president, Georges Theunis, in an article in the New York *Times:*

> This (the competitive) economic system is based on private initiative, on the development of the individual and on the maintenance of personal liberty in the greatest possible measure.
>
> On the other hand, the system which is proposed by the Soviets as the ideal system reduces the individual to the rôle of an inert organ, a part of a vast machine which crushes him by its formidable strength. The total suppression of personal liberty, the subjection to anonymous orders—such are the characteristics of the régime. All classes, from the peasant to the workman, are reduced to a state of complete slavery, under the absolutism of an all-powerful, heartless and pitiless bureaucracy.

Fabricators Gainers

AMERICAN industry has been given another reason to be proud of its achievements. The Bethlehem Steel Co. and two of the Steel Corporation subsidiaries, the Carnegie Steel Co. and the Illinois Steel Co., have apparently come together on standardization of wide flange structural sections. Their handbooks

issued for the fabricators show identical groups of sections in terms of heights and weights and almost precisely the same section moduli. The development is undoubtedly an outcome of the Steel Corporation-Bethlehem patent infringement suit, which was settled out of court, but at the same time it did not just necessarily follow. Instead, it represents a broad concern over the problems of the fabricator. It brings about interchangeability when the keenness of competition might easily have ruled against it. Certainly the user of shapes is a gainer, while simplification, and its attendant elimination of little used sections, will help the mills. It is however equally cheering to industry as a whole to record such an example of cooperation and broad vision. It stands as an illustration of the difference between industrial movements here and abroad.

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Kinds of Steel in an Off Year

ONE would expect that in an off-year steel demand would fall off variously as to the different descriptions. Thus the official statistics of production in 1930 show quite an assortment in the decreases from 1929, the record year as to total steel production and as to the majority of rolled products.

Production of steel ingots decreased 27.8 per cent, from 54,850,433 tons in 1929 to 39,595,268 tons in 1930. The smallest loss was in basic open-hearth, 27.4 per cent, Bessemer decreasing 29.2 per cent and acid open-hearth 36.3 per cent. Acid open-hearth, however, had been trending downward for a long time, maximum production having occurred in 1917 (and even in 1929 production was only 41 per cent as large). Crucible ingots almost disappeared, decreasing 73 per cent to 1563 tons last year, their maximum, 122,882 tons, having been reached in 1917 also. Electric ingots are in the opposite category, having increased sharply up to 1929, but they dropped by 42.3 per cent for 1930, reflecting plainly a greater decline in demand for special steels than for ordinary steel.

There was a decline of nearly 38 per cent in automobile production from 1929 to 1930, with a decrease in the average weight per car, as light cars were more in vogue. And one sees a decrease of 38.3 per cent in alloy steel production. Apparently demand for alloy steel held up a little better outside the automobile industry.

Production of duplex steel ingots is not reported separately, but production of duplex ingots and castings decreased 30.9 per cent to 2,045,277 tons. There has been no general growth in this process but rather a slipping, for while 1929 production was 2,961,292 tons, there were several years prior to 1921 showing more than 3,000,000 tons.

Production of finished rolled steel decreased 28.1 per cent, or just a shade more than ingot production, presumably because, in a general way, production of light rolled products suffered less than heavy products. There may have been an increase in stocks of ingots and semi-finished steel, for the Steel Corporation report shows an increase in valuation during the year, when unit prices could scarcely have increased.

Rolled iron decreased 33.5 per cent last year, to 316,053 tons. In 1920 and for many years previously it ran over a million tons.

Of the important finished products seamless tubes made the best showing, with a decline of only 8.4 per cent. This was to be expected by reason of last year's demand for line pipe, no small part of which was supplied in seamless form. In fact, there was an increase in seamless "oil country goods" of 4.5 per cent, to 913,763 tons. Tin plate came next in smallness of loss, 10.4 per cent, quite in line with the usual thing.

Strips had a relatively small loss, 22.4 per cent, possibly at the expense of sheets, which decreased 33.2 per cent. For the first time strip production is separated by sizes, last year's total of 1,941,862 tons comprising 669,698 tons of 6-in. and under, 787,748 tons of over 6-in. to 24-in., and 484,416 tons of over 24-in.

Decreases in plates, shapes and rods ranged from 25 to 27 per cent, or less than steel generally, shapes being helped by structural work holding up rather well, and plates by demand for electric-weld pipe. Rails decreased 31.2 per cent and bars 36.1 per cent.

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Steel Decrease Not Unusual

SOME observers may have been disappointed because the rate of steel production decreased 9 per cent from March to April. Yet the performance this year is quite in keeping with precedent.

The years since 1923 make a consistent showing that other things being equal the rate of steel production in April should be just about equal to the rate in February. The April rate this year was just four-tenths of one per cent above the February rate, while March was about 10 per cent above either month.

Steel has not had an undue decrease in tonnage and does not indicate that general business has been swinging either way. Orders are much smaller, more numerous and for much quicker delivery than formerly.

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Contributory Unemployment Insurance

AMERICAN manufacturers are becoming deeply interested in unemployment insurance. They are studying to establish possibly some plan of their own for their own employees. They also must keep intelligent watch on proposed legislation which might create a compulsory system that would become a serious burden on industry. The depression has emphasized the need of some organized, automatic method of helping workers in the period immediately following the loss of a job.

At the same time the depression has afforded the experience from which to take measure of costs of this type of insurance with a more or less close approach to actuarial exactness. Such a knowledge has hitherto been practically nonexistent. The difference in payrolls between 1929 and 1930, or it might be better to take the last nine months of 1930 and the

first quarter of the current year, affords a pretty good yardstick. The future may bring higher or lower levels of employment, but these two years, coupled with the average years which preceded them, should yield dependable data from which to work out a practical plan. In addition, we have the experience of a number of corporations which have already operated unemployment insurance for several years. Some of these private plans have proved satisfactory; others have not been so successful. They have all been subjected to a severe strain, and doubtless lessons have been learned which will be of value.

The subject is exceedingly intricate. Unemployment insurance must not be made so costly that to maintain it would impose a handicap in competitive markets. Many nice points are involved. For instance, what share of his working wage shall an employee receive in his idleness? How long shall he receive it? For what causes may an employer discharge a man or woman without assuming liability to pay unemployment wage? How long must he be employed in order to benefit in case of enforced idleness? Shall the plan be contributory, employee as well as employer paying in money regularly to create an insurance fund? And if contributory, shall it be compulsory, or shall it apply only to such workers as elect to contribute? These and other questions must be considered.

It seems fundamentally important that a system to be fair and sound should be on a contributory basis, which means that employer and employee go fifty-fifty in building up the fund, or, if the insurance companies decide to enter this new field, in paying the premiums. Few favor the British plan, under which employer, employee and the state pay equally into a common pool, administered by the government, in which the idle, incompetent and lazy share on equal terms with the worthy workman.

Most American employers and many workers would not like a system under which laid-off workers would accept money which they had not earned. The idea does not lend to self-respect. The industrial pension is quite another thing; the employer gives it because he believes the employee has earned it by long and faithful service. Under unemployment insurance a man might not have been employed in a factory more than six months or a year (whatever the limit might be) when he begins to receive his unemployment benefit. Certainly it does not seem unreasonable that he should have paid his share of the cost of a system which promises to do so much for him.

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CORRESPONDENCE

Our Manufacturing Worker and His Wage

To the Editor:—Your leading article in the issue of April 16 is interesting, but differs from the figures we have on file on this subject. According to our records for the following years, the value of product in 1904 was $880,514,000, and the wages paid were $306,276,000, or 34.8 per cent; while the sales for 1909 were $1,228,475,000, and the wages for that year were $415,316,000, or 33.8 per cent.

The businesses covered were machines, castings, pipe, builders' hardware, saddlery hardware, plumbers' hardware, steam fittings and structural iron work. These percentages agree more closely with our own experience than those you published.

X. Y. Z. COMPANY.

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[Our correspondent's calculations were made on the basis of what is perhaps a 6 per cent section of the total of American manufacturing. The fact that the wage ratio in that section worked out around 34 per cent, against about one-half as much for all manufacturing, may be accounted for in a number of ways. It probably is a complex of several of them.

Some kinds of manufacture involve a relatively small amount of material, upon which a relatively large amount of labor is expended for each million dollars of product. Other lines expend only a small amount of labor on a large proportion of materials, to get the same total product. Machines, hardware, structural iron work, etc., fall naturally into the classification having a high labor charge compared with that for material.

Another factor lies in the degree of integration of the plants within an industry. A concern or industry which is pretty well integrated has a relatively high labor charge and small material charge, compared with an industry in which a given article passes through several separate corporate hands before getting into final consumption. In this latter case the finished product of one plant becomes the raw material for a second; the finished product for the second becomes the raw material for a third, etc.

Under such conditions there is much duplication in the material item, whereas the total labor charges will not be greatly larger than those for an integrated plant, taking the original raw material and turning out a product ready for sale.—*The Editor.*]

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Where Was Pressed Metal First Produced?

To the Editor: I have made several efforts to find out where the first pressed metal was produced. I would like to know about the first pressed metal made by the cold process in power presses, either in this country or in Europe.

So far, I have only been able to find that some company produced ferrules for screw-drivers and similar hand-tools, importing Norway or Swedish iron for the purpose.

I am wondering if some one of your readers cannot supply the name of the company which first manufactured pressed metal.

Sheet Metal Manufacturer.

Decline in Steel Ingot Production Is Checked

RAW Steel Output Unchanged at 47 Per Cent—Automobile Plant Operations Exceed Expectations—Scrap Prices Reach New Low Levels

STEEL demand shows a tendency to level off rather than to decrease further, and the gradual decline in ingot output which began in the latter part of March has been arrested. Operations of finishing mills continue to vary, with slight gains in some products offset by losses in others, but raw steel production for the country at large remains unchanged at 47 per cent of capacity.

Factors that have done the most to check the downward trend of steel demand are a better performance by the automobile industry than had been expected and a larger movement of structural steel, reinforcing bars and line pipe. Tin plate production, although still relatively high at 70 to 75 per cent of capacity, is tapering in line with seasonal influences, and specifications from farm equipment makers have receded. Rail mill operations are slightly higher at Pittsburgh and a few points lower at Chicago. Miscellaneous orders for steel have remained at the low level of the last few weeks, reflecting the extreme conservatism of the average buyer.

THE sagging tendency of prices has not been halted. THE IRON AGE composite for heavy melting scrap has declined from $10.33 to $9.83 a gross ton, the lowest figure since Nov. 19, 1914. At Pittsburgh this grade fell 25c. a ton, at Chicago 50c. and in eastern Pennsylvania 75c. In the last-named district 2000 tons was bought at $9, delivered, the lowest price paid in that market since 1896. Curtailed consumption and large yard accumulations are both depressing factors, but Pittsburgh opinion is that scrap prices are approaching bottom and signs of accumulating resistance to the trend are seen in advances of $1 a ton on machine shop turnings in Cleveland and 25c. a ton on borings and turnings at Detroit.

PIG iron for local delivery is off 50c. a ton at Buffalo, and Connellsville furnace coke is more commonly available at $2.40, a decline of 10c. a ton. Alloy steel bars have been sold to drop forge manufacturers in the automotive field at 2.45c., base, the same price that had previously been granted to some of the larger motor car builders and $4 a ton lower than the ruling quotation to consumers outside of the automobile industry. Automobile body sheets have broken $2 a ton to 3c. a lb., Pittsburgh, on sales at Detroit. Scattered concessions to $1 a ton to $29, Pittsburgh, are reported on billets, slabs and sheet bars.

A manufacturer of strip steel has announced an advance of $1 a ton to 1.55c. and 1.65c. a lb., Pittsburgh, on third quarter business in hot-rolled material.

Complete prices on sheets under the new classification announced by the American Rolling Mill Co. have now been announced for third quarter shipment. The new schedule, which is intended to bring prices into closer adjustment with costs under present methods of manufacture, involves both reductions and advances.

AUTOMOBILE production in May is now estimated at 370,000 units, as compared with 348,909 in April, the peak so far this year. June output is conditioned by the plans of the Ford company, which are shrouded in mystery, but a total of at least 325,000 cars is looked for.

Fabricated structural steel inquiries exceed 91,000 tons, comparing with 39,000 tons last week and 103,000 tons two weeks ago. The largest item in the current total was 58,000 tons for a bridge over the Mississippi River at New Orleans. New projects reported in THE IRON AGE since the first of the year total 1,248,000 tons, compared with 582,000 tons in the corresponding period last year and 679,000 tons in 1929. Awards of the week were small, calling for only 16,500 tons.

THE decline of 9 per cent in steel ingot production in April, as disclosed by the American Iron and Steel Institute's monthly report, was in line with expectations. The recession of 97,601 tons in the Steel Corporation's unfilled orders was less than seasonal—the average for the previous 10 years being 261,000 tons—lending support to the view that steel demand is close to bottom.

Zinc has advanced to 3.27½c., East St. Louis, after having reached 3.25c., the lowest since 1894. Tin, at 23.12½c., New York, has recovered slightly from last week's 22.75c., which was the lowest figure since 1902. Copper remains at 9c., Connecticut valley, the lowest since 1894. Lead has been reduced to 3.75c., New York, the lowest price since 1915.

THE IRON AGE composite prices for finished steel and pig iron are unchanged.

PITTSBURGH

Recession in Steel Demand and Operations Checked—Scrap Declines Again

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Recession in steel business and operations checked, at least temporarily.

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Orders for automobile steel, structural and reinforcing steel are principal supporting factors.

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Slight increases in finishing mill schedules at some points. Tin plate output slightly lower.

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Weakness in semi-finished steel and furnace coke.

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Scrap market believed to have reached bottom as further declines occur.

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PITTSBURGH, May 12. — The local steel market may be said to have held its own in the last week, and both incoming tonnage and operations seem to have been fairly well maintained, following several weeks of slow decline. A somewhat better performance by the automobile makers than has been expected this month, coupled with slight improvement in the movement of structural steel, reinforcing bars and line pipe, are the factors which have done the most toward checking the downward trend. While some further curtailment may be expected as seasonal declines in automobile production make themselves felt, it is not generally believed that steel operating rates during the summer months will decline more than a few points under present levels.

Steel ingot production in the Pittsburgh district continues at approximately 45 per cent of capacity, with output in the Valleys holding at recent levels and Wheeling district production maintained at 50 per cent or slightly better. Finishing mill production has also held its own, with slight increases reported in sheet operations at some points, and tin mill production fractionally lower. A declining tendency in output of tin plate is not unexpected at this season of the year, as both canning companies and container manufacturers are marking time in anticipation of more definite crop reports.

No important line pipe awards have been reported in the last week, and negotiations continue on several projects, which must soon be let if completion before the end of the season can be expected. An example of the ability of mills to fill orders for this material quickly is offered by an order for a substantial tonnage placed a few weeks ago which has already been completed. Standard pipe has reflected only very slight seasonal improvement in the last month or two. No change is reported in railroad releases, although the local rail mill is able to maintain its operating schedules, and track accessory production has not declined materially.

Prices are unchanged except in the case of automobile body sheets, which are weaker. Producers of strip are beginning to consider third quarter quotations, and one maker is already attempting to maintain prices $1 a ton over recent minimum figures. The market on heavy hot-rolled products remains at 1.65c., Pittsburgh, with little new buying to test quotations. Sales of semi-finished steel are reported to have been made at $29, Pittsburgh, as compared with a recent nominal $30 price.

In the raw material market, furnace coke is more freely available at $2.40, Connellsville, a decline of 10c. a ton. Pig iron prices seem to be fairly well maintained, but scrap has again declined on most of the principal grades, with No. 1 heavy melting steel down 25c. a ton on the basis of small sales by the railroads.

SEMI-FINISHED STEEL

Shipments so far this month are falling slightly under those of the corresponding April period. No sales are reported to test current market quotations, which continue nominal at $30, Pittsburgh, for billets, slabs and sheet bars. Wire rods are unchanged at $35, with occasional small sales at $37.

PIG IRON

Consumers of pig iron in this district are still restricting their purchases to their immediate needs, which are very small. Small users of foundry iron which ordinarily require several cars a month are not using as much as a carload in an even longer time, and contract buyers are specifying in a very limited way. Occasional sales of foundry, malleable and Bessemer iron are bringing $17, Valley furnace, and $17.50, Pittsburgh furnace, and the basic market has not been tested in so long a time that anything more than a nominal quotation is impossible. One merchant stack is operating in the Pittsburgh district and one in the Valleys, but the Valley unit may soon be blown out.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$16.50 to $17.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton f.o.b. Pittsburgh district furnace:

Basic	$17.00 to $17.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

RAILS AND TRACK SUPPLIES

Releases of track accessories for May delivery have been fairly satisfactory, and shipments this month may not fall materially under those of April. Rail mill schedules this week are slightly higher. Each month the carriers are postponing shipping orders longer than usual, but when releases finally come in they are usually up to expectations. The low rate of activity in railroad yards and shops is not fully reflected in rail-laying programs.

BARS, PLATES AND SHAPES

Sentiment in this market is still buoyed up by expectations of gradual increases in demand. However, current business, particularly in plates and shapes, leaves a great deal to be desired, the most striking lack of tonnage being in small miscellaneous orders, which are badly needed to balance operating schedules in mills as well as fabricating shops. Shapes are being shipped regularly to large projects in various parts of the country, but backlogs are not being materially increased, and operations of the smaller fabricators are very unsatisfactory. Movement of reinforcing bars is somewhat more encouraging, largely because of heavy road work. Merchant bars are very dull, and little change is reported in demand for alloy material from the automobile industry.

Barge buying has not been active in the last week, but the volume of inquiry is holding up and there is some likelihood of several fair-sized awards being made in the next week or two. In some cases floating equipment has been authorized, but no appropriations have been made. Other private buyers are awaiting a business upturn before committing themselves. Fabricators of steel tanks are encouraged by considerable inquiry from the east Texas fields. Business with these companies thus far in the spring has been very poor.

Shipments of plates to railroad car builders and car shops are very light.

No change in price is reported, but the market on all three heavy products can hardly be placed at more than 1.65c., Pittsburgh. While mixed carloads and very small lots have occasionally brought 1.70c., mills seem

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous. Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	May 12, 1931	May 5, 1931	Apr. 14, 1931	May 13, 1930
No. 2 fdy., Philadelphia	$17.26	$17.26	$17.76	$19.76
No. 2, Valley furnace	17.00	17.00	17.00	18.50
No. 2 Southern, Cin'ti	14.69	14.69	14.19	16.69
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.50	17.50	17.50	19.00
Basic, del'd eastern Pa.	17.00	17.00	17.25	18.75
Basic, Valley furnace	16.50	16.50	16.50	18.50
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	20.76
Malleable, Chicago*	17.50	17.50	17.50	19.00
Malleable, Valley	17.00	17.00	17.00	19.00
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seaboard	80.00	80.00	80.00	94.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	30.00	30.00	30.00	33.00
Sheet bars, Pittsburgh	30.00	30.00	30.00	33.00
Slabs, Pittsburgh	30.00	30.00	30.00	33.00
Forging billets, Pittsburgh	36.00	36.00	36.00	38.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.65	1.65	1.65	1.80
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.65	1.65	1.65	1.75
Bars, Chicago	1.70	1.70	1.75	1.85
Bars, Cleveland	1.65	1.70	1.70	1.75
Bars, New York	1.98	1.98	1.98	2.09
Tank plates, Pittsburgh	1.65	1.65	1.65	1.75
Tank plates, Chicago	1.70	1.70	1.75	1.85
Tank plates, New York	1.93	1.93	1.93	1.97½
Structural shapes, Pittsburgh	1.65	1.65	1.65	1.75
Structural shapes, Chicago	1.70	1.70	1.75	1.85
Structural shapes, New York	1.90½	1.90½	1.90½	1.94½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.55	1.55	1.55	1.70
Cold-rolled strips, Pittsburgh	2.15	2.15	2.25	2.55

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	May 12, 1931	May 5, 1931	Apr. 14, 1931	May 13, 1930
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.15	2.15	2.25	2.55
Sheets, black, No. 24, Chicago dist. mill	2.35	2.35	2.35	2.65
Sheets, galv., No. 24, P'gh	2.80	2.80	2.85	3.20
Sheets, galv., No. 24, Chicago dist. mill	2.90	2.90	2.95	3.30
Sheets, blue, No. 13, P'gh	2.00	2.00	2.05	2.15
Sheets, blue, No. 13, Chicago dist. mill	2.10	2.10	2.15	2.25
Wire nails, Pittsburgh	1.90	1.90	1.90	2.15
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.20
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., P'gh	2.55	2.55	2.55	2.80
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.85
Tin plate, 100-lb. box, P'gh	$5.00	$5.00	$5.00	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$11.25	$11.50	$12.25	$15.50
Heavy melting steel, Phila.	9.50	10.25	10.25	13.50
Heavy melting steel, Ch'go	8.75	9.25	10.00	12.50
Carwheels, Chicago	8.75	9.50	9.50	14.00
Carwheels, Philadelphia	12.50	12.50	12.50	15.00
No. 1 cast, Pittsburgh	11.00	11.75	12.25	14.25
No. 1 cast, Philadelphia	11.50	11.50	11.50	14.00
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.50	12.75
No. 1 RR. wrot., Phila.	11.00	11.00	11.00	15.00
No. 1 RR. wrot., Ch'go (net)	7.50	7.50	8.25	11.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.50	$2.50	$2.50	$2.50
Foundry coke, prompt	3.50	3.50	3.50	3.50
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	8.62½	9.87½	10.12½	13.00
Electrolytic copper, refinery	8.75	8.75	9.75	12.75
Tin (Straits), New York	23.12½	23.25	25.60	32.87½
Zinc, East St. Louis	3.27½	3.25	3.80	4.60
Zinc, New York	3.62½	3.60	4.15	4.95
Lead, St. Louis	3.60	3.80	4.25	5.50
Lead, New York	3.75	4.00	4.50	5.60
Antimony (Asiatic), N. Y.	6.60	6.70	6.90	7.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

to be more interested in maintaining a 1.65c. minimum than in seeking the higher price. Irregularity in reinforcing bar quotations is still reported from the East, but no evidence is forthcoming that any general downward revision is in sight.

COLD-FINISHED STEEL BARS

Releases from the automobile industry for May shipment have been ahead of the expectations of some mills, but miscellaneous demand continues very sluggish. The industry is engaged at about 35 per cent of capacity, with prices well maintained at 2.10c., Pittsburgh.

BOLTS, NUTS AND RIVETS

The recent downward trend in demand seems to have been checked, and the rate of incoming business in the last week or two has been sustained. Railroad consumption is lacking, but rivets are in fair demand from the structural steel industry as well as from the automobile builders. Operations average about 35 per cent of capacity. No marked price irregularity is reported.

TUBULAR GOODS

Pittsburgh mills have taken a fair amount of line pipe tonnage in the last week or two, although most of the orders have called for less than 50 miles of material. The Pennsylvania Power & Light Co. is said to have placed the pipe for a small gas line, to run from Tioga to Williamsport, Pa., with a Pittsburgh producer. The plan of the North Central Gas Co. to lay a line from Wyoming into western Nebraska apparently has been abandoned, and a line extending from Providence, R. I., to Worcester, Mass., may be delayed for a long time. Pittsburgh producers are still figuring on two large orders for export to Rumania and Asia Minor respectively, but the financing requirements involved are adverse to the placing of the business. Pipe producers are watching developments in connection with the new east Texas oil field very closely, as lines contemplated in this section seem more likely to be rushed along than other projects which are not so immediately needed. Demand for standard pipe has improved slightly in the last month, but is still more depressed than at any time in recent years. Oil well casing is also rather quiet, and demand for mechanical tubing and boiler tubes is still sluggish.

WIRE PRODUCTS

Business continues rather quiet, although manufacturers' wire, going principally to the automobile industry, is in good demand. The requirements of the bolt and nut makers are light, and spring wire is very dull. Shipments to jobbers in the South and West are somewhat lighter following a comparatively heavy movement in April. Prices are unchanged, with little effort being made to secure more than 2.20c., Pittsburgh, on manufacturers' wire, and $1.90 a keg for nails.

SHEETS

Although a few mills received more or less unexpected releases from the automobile industry last week, general demand for sheet steel products has not changed to any extent and continues at about 45 per cent of

THE IRON AGE COMPOSITE PRICES

	Finished Steel	Pig Iron	Steel Scrap
May 12, 1931	2.114c. a Lb.	$15.79 a Gross Ton	$9.83 a Gross Ton
One week ago	2.114c.	15.79	10.33
One month ago	2.128c.	15.79	10.83
One year ago	2.228c.	17.58	13.83
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel		Pig Iron		Steel Scrap	
	High	Low	High	Low	High	Low
1931	2.142c., Jan. 13	2.114c., May 5	$15.90, Jan. 6	$15.71, Feb. 17	$11.33, Jan. 6	$9.83, May 12
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

theoretical mill capacity. Galvanized material for roofing and agricultural uses is in fair demand and culvert stock is still moving well. Electric refrigerator makers have cut down on their orders in the last fortnight, and makers of office furniture and steel shelving are not so active. Mill operations range from 40 to 45 per cent of capacity, with many plants on week in and week out basis.

Prices still tend toward weakness. Full adherence to the new selling schedules announced recently is now rather generally postponed until third quarter buying gets under way. In the meantime, quotations on some grades of sheets are weaker, particularly on automobile body stock, which is now rather freely available in the Detroit territory at 3c., Pittsburgh. While the situation has largely arisen from the competition of local mills in that district, sellers at Pittsburgh and in the Valleys have been forced to meet the lower prices. On black sheets, 2.15c., Pittsburgh, is being done rather freely in some territories, although some mills continue to quote 2.25c. Galvanized sheets are fairly well held at 2.80c., and light plates and blue annealed material at 1.85c. and 2c. respectively, Pittsburgh.

TIN PLATE

Further curtailment in tin mill operations at a number of plants has reduced the average for the industry slightly, with operations now ranging from 70 to 75 per cent of capacity. Only one or two of the independents are now fully engaged. Chicago district operations are considerably above those at Pittsburgh and in the Wheeling district. Shipments are well maintained because of heavy releases from the container manufacturers, and recent declines in specifications may be considered largely seasonal.

STRIP STEEL

One maker of strip has instructed its sales organization to adhere strictly to 1.55c. and 1.65c., Pittsburgh, on hot-rolled material, and others are expected to adopt these minimum figures on third quarter business. In the meantime tonnage is still going at 1.50c. and 1.60c., although the industry seems determined to secure better prices in the second half of the year. No interest in third quarter requirements has been shown, and the fact that mills are already beginning to consider prices for this period indicates their determination to check further declines. Cold-rolled strip is well maintained at 2.15c. to 2.25c., although the higher figure does not apply to large tonnages. Specifications this month have just about equaled those of the corresponding April period, and no further decline in tonnage has been reported since the beginning of May. Automobile demand has held up better than expected.

COKE

No new business in furnace coke is reported. Occasional carload lots are being sold at $2.40 to $2.50, Connellsville. The foundry grade is equally dull, with shipments this month about equaling those of April. The coal market is dull. Lake cargo movement is slow in getting under way.

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.75c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.35c.
Squares and flats	3.85c.
Bands	3.10c.
Hoops	4.10c.
Black sheets (No. 24), 25 or more bundles	3.25c.
Galv. sheets (No. 24), 25 or more bundles	3.60c.
Light plates, blue annealed (No. 10)	2.75c. to 3.00c.
Blue annealed sheets (No. 13)	2.90c. to 3.05c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.82c.
Spikes, large	2.65c.
Small	2.90c. to 3.05c.
Boat	3.15c.
Track bolts, all sizes, per 100 count	60 and 10 per cent off list
Machine bolts, 100 count	60 and 10 per cent off list
Carriage bolts, 100 count	60 and 10 per cent off list
Nuts, all styles, 100 count	60 and 10 per cent off list
Large rivets, base per 100 lb.	$3.30
Wire, black, soft ann'l'd, base per 100 lb.	2.40
Wire, galv. soft, base per 100 lb.	2.85
Common wire nails, per keg	$2.10 to 2.15
Cement coated nails, per keg	2.15

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

OLD MATERIAL

Continued decline in scrap prices during the last week has brought both buyers and sellers to the belief that quotations are approaching bottom. Small tonnages of No. 1 heavy melting steel, disposed of by the railroads in their recent lists, brought prices ranging from $11.25 to $11.50, and rails were sold at considerably less. Compressed sheets are not thought to be worth more than steel, although the market has not been tested by consumer buying. Heavy steel axle turnings have declined, and all the acid open-hearth grades are lower. No. 1 cast has been bought by consumers at $11, and heavy breakable is not higher than $9. Blast furnace material alone has maintained its recent strength, with borings and turnings not available to dealers at less than $7.50, and some of them paying as high as $8 to cover recent orders.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$11.00 to $11.50
No. 2 heavy melting steel	9.50 to 10.00
Scrap rails	10.75 to 11.25
Compressed sheet steel	11.00 to 11.50
Bundled sheets, sides and ends	8.50 to 9.00
Cast iron carwheels	11.50 to 12.00
Sheet bar crops, ordinary	11.50 to 12.00
Heavy breakable cast	8.00 to 8.50
No. 2 railroad wrought	11.00 to 11.50
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	6.50 to 7.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	14.00 to 14.50
Railr. coil and leaf springs	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Low phos. billet and bloom ends	15.00 to 15.50
Low phos. mill plates	13.00 to 13.50
Low phos. light grades	13.00 to 13.50
Low phos. sheet bar crops	14.00 to 14.50
Heavy steel axle turnings	9.50 to 10.00
Electric Furnace Grades:	
Low phos. punchings	14.00 to 14.50
Heavy steel axle turnings	9.50 to 10.00
Blast Furnace Grades:	
Short shoveling steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Rolling Mill Grades:	
Steel car axles	16.50 to 17.00
Cupola Grades:	
No. 1 cast	10.50 to 11.00
Rails 3 ft. and under	13.00 to 13.50

CHICAGO

Steel Business Shows No Further Recession—Scrap Prices Lower

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CHICAGO, May 12.—Probably the most encouraging feature of the local iron and steel market is its tendency to level off rather than to continue the downward course it took in the late days of April. It is true that prices for scrap continue to recede and that finished steel quotations are somewhat unstable in highly competitive territories lying between major producing centers, but the fact cannot be overlooked that tonnages are holding up remarkably well, all things considered. Orders from the manufacturing trade are individually small and no one industry seems to have the stability that will assure its being steadily in the market. However, the slack caused by recession in one direction is almost invariably taken up almost in whole by an increased demand from another quarter.

New buying of finished steel remains at close range and in insufficient volume to keep backlogs from dwindling. Specifications are in the aggregate about equal to the average of recent weeks, and ingot output is holding at 48 per cent of capacity, or possibly a shade higher.

The outlook in the structural field is the best so far this year. Awards are heavier and not only are inquiries of satisfactory size but work on engineers' boards is distinctly encouraging.

The Great Northern is now in the market for 500 superstructure sets for box cars. This inquiry about sums up the railroad equipment market even to the point of repairs let to contract shops.

Agricultural implement manufacturers are again scaling down operations and are pinning their hopes on the last half of the year and the outlook for this year's crops. Last winter having been mild, farm work is farther advanced than is usual at this time of the year. Soil conditions are said to be ideal in most sections of the country and seed beds have been well prepared. On the whole, the farm outlook is favorable.

Steel demand shows tendency to level off rather than to decrease further.

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Operations for the district now at 48 per cent or a shade higher.

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Outlook for structural steel is the best so far this year.

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Crop outlook favorable, thereby offering some encouragement for last half of year.

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Scrap prices take a further tumble, with heavy melting steel now at an average price of $8.75.

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PIG IRON

Recent days have been among the quietest in this year's pig iron market. Shipments are not far from the April average, but new releases, by which some gage can usually be had of the immediate future, are less numerous and therefore it is difficult to attempt to chart the course of the market. Little tonnage is being bought, though prices appear to be well established at $17.50 a ton, local furnaces. Southern iron is moving to this market in scattered carloads at $11, Birmingham. The charcoal iron market has definitely settled to the $24 a ton furnace level.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

FERROALLOYS

This market is extremely quiet both as to inquiries and releases against contracts. It has been many weeks since an opportunity has been offered to gage the price structure.

COKE

Prices for by-product foundry coke are well established at the new quotations of $7.50 a ton, local ovens. Spot buying is sluggish, as is usual at this time of year. Releases against contracts have shown little variation in recent weeks.

BOLTS, NUTS AND RIVETS

Demand for these commodities is a shade lighter, thereby giving rise to the thought among sellers that May deliveries may not prove to be as heavy as shipments in April. There is a steady and, in some instances, an increasing demand from manufacturers of automobiles. Jobbers at Milwaukee are indicating heavier requirements. However, farm machinery builders are going to lower output levels, thereby cutting down gains in other directions.

WAREHOUSE BUSINESS

Distribution by warehouses is again on the upgrade, the past week having been the best so far this year. Each month in 1931 has had its peak week, which was above the best week in the preceding month. However, in February, March and April the best week came near the end of the month, but in May a new peak has been reached before the end of the first half. Warehousemen are hopeful that the last two weeks in the present month will make even a better showing. Although demand from the country has made some headway, it is the increased buying in the city that is carrying the warehouse business forward.

STRUCTURAL MATERIAL

Awards, at 5000 tons, are well up to the total of the first week of May. Fresh inquiries total 13,000 tons. There is now actively in the Midwestern market not less than 70,000 tons, and it is said that another 155,000 tons is on engineers' boards. It is noticeable that there is better distribution of going tonnages among the various shops, which, added to the increased number of estimates being made, is distinctly encouraging to fabricators. May has brought a slight improvement in shop operations in this district.

WIRE PRODUCTS

The merchant trade is again beginning to buy, after having been carried along on heavy specifications entered at the end of March against first quarter contracts. Specifications from the manufacturing trade are steady. Concrete mesh is moving rapidly, and the prospect is that May deliveries will exceed those of the same month last year. Demand for woven wire fencing is sluggish, a situation not uncommon at this time of year, when farmers are busily engaged in the fields. The nail market remains quiet. Specifications for copper wire and cables are disappointing. Cool weather for several weeks over a large portion of the country has resulted in slow development of crops. However, the agricultural outlook is more favorable than in some years.

COLD-ROLLED STRIP

Demand is variable, and output has dropped to a range of 30 to 35 per cent of capacity.

PLATES

The local plate market is quiet, pending developments in oil producing centers and distribution of skelp tonnage for pipe orders recently taken. There still seems to be a possibility that tank orders may develop from the new oil field in east Texas. The plan for proration of production has not yet been put in effect, and engineers for the oil companies continue to arrange for needed tankage. Shipments of plates to pipe mills remain steady. It is too early for plate mill schedules to feel the impulse of releases against recent pipe business. No news of interest has developed in the railroad equipment field. Railroad repair shops, which are concentrating with limited schedules on the maintenance of wooden and composite cars, are taking little steel.

BARS

This commodity is holding the market position it gained a week ago. In fact, there is noticeably a slight increase in demand, which is a reflection of consumption by automobile manufacturers and the needs of contractors who are engaged on paving contracts. Alloy bar mill schedules are well sustained at 45 per cent of capacity. The iron bar market seems to be unable to make headway, with current demand running very light. Output of rail steel bars is steady, but specifications are more spotty. Barn equipment manufacturers have entered a few orders, but sellers of bars are not hopeful that this industry will step forward until some time in the fall. Shipments of fence posts are gradually diminishing as the active season draws to a close.

RAILS AND TRACK SUPPLIES

Output of standard-section rails has dropped several points to an average that is not above 43 per cent of capacity for the district. In many previous years the railroads laid out rather definite shipping programs which they adhered to and at times exceeded, but this year they have more or less disregarded their schedules, preferring to take tonnages on specifications as the rails were actually needed. The rail market, from the viewpoint of buying, is very dull. Orders for track accessories are small in the aggregate, but specifications are the best in several months.

CAST IRON PIPE

Demand for cast iron pipe is lagging, though sellers are inclined to believe that the lull is temporary. United States Pipe & Foundry Co. is low bidder at Milwaukee on 1150 tons of 6 to 20-in. pipe and special castings. The bid is $35.10 a ton, Birmingham, if let in the aggregate; otherwise, the price is $1 higher. James B. Clow & Sons have taken 700 tons for Jackson, Mich. Valparaiso, Ind., has awarded 300 tons to an unnamed bidder. Small inquiries and awards are moderately active.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $43 to $44; 4-in., $46 to $47; Class A and gas pipe, $3 extra.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.90c.
Reinforcing bars, billet steel	1.70c. to 2.00c.
Rail steel reinforcement—	
For buildings	1.45c. to 1.65c.
Highway slabs	1.6.c.
For bridges and culverts	1.75c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.35c.
Flats and squares	3.85c.
Bands, ⅞ in. (in Nos. 10 and 12 gages)	3.10c.
Hoops (No. 14 gage and lighter)	3.65c.
Black sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes (⅝ in. and larger)	3.45c.
Track bolts	4.50c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	60 and 10
Carriage bolts	60 and 10
Coach and lag screws	60 and 10
Hot-pressed nuts, sq., tap. or blank	60 and 10
Hot-pressed nuts, hex., tap. or blank	60 and 10
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

SHEETS

Specifications are irregular, and hot mills are having difficulty in holding output at 45 per cent of capacity. Conductor pipe manufacturers are taking larger quantities, but are still producing below normal for this time of year. Shelving and locker plants are on light schedules, while small container manufacturers are probably the most active among local sheet users. Distribution by warehouses is steady.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.40c. to 2.50c.; No. 24 galv., 2.95c. to 3.05c.; No. 10 blue ann'l'd, 2.00c. to 2.10c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

REINFORCING BARS

This market continues to move in an erratic course. Shop operations are at about 50 per cent of capacity, whereas full output is normal for this time of year. Prices are giving concern to the trade. Billet steel reinforcing bars, after dropping to 1.90c. a lb., warehouse, give signs of further weakness, with some quotations out at 1.85c. Estimating bureaus are busy on many small tonnage projects. In spite of the fact that many of these turn to orders, there is complaint that estimating costs, under the circumstances, are high and therefore burdensome.

OLD MATERIAL

The Chicago scrap market is continuing its downward trend. Heavy melting steel has sold off another 50c. a ton. A steel mill has taken a fair tonnage at $9 a gross ton, delivered. Rerolling rails are off 75c. to $11 a ton on a recent sale, and dealers making new offers at this figure find no takers. Cast iron car wheels, at $9.25, also are 75c. a ton lower on sales to steel mills, which are making use of them to supplant pig iron. Practically none of this grade is moving to wheel foundries, which are laboring under a stagnant railroad equipment market. Sentiment in the scrap trade is mixed. There are some dealers who are on the verge of offering heavy melting steel at $9, while others are somewhat hesitant for the reason that they expect cost of preparation and the inclination of producers to speculate to be among the factors that will soon build resistance to lower prices. The tendency noted last week for the railroads to check the flow of scrap does not appear to have gained headway except that the subject is evidently being given more study. An illustration of the condition of the market is given by the fact that an inquiry for 1500 tons of punchings to be used for ballast is virtually going begging. With car shops inactive and fabricators working only part time, there seems to be an acute shortage of this grade. In the absence of sales, prices on many grades are nominal.

Prices deliv'd Chicago district consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$8.50 to	$9.00
Shoveling steel	8.50 to	9.00
Frogs, switches and guards, cut apart, and misc. rails	8.50 to	9.00
Factory hyd. comp. sheets	7.00 to	7.50
Drop forge flashings	6.00 to	6.50
No. 1 busheling	6.75 to	7.25
Forg'd cast and r'l'd steel carwheels	11.50 to	12.00
Railroad tires, charg. box size	11.75 to	12.25
Railroad leaf springs cut apart	11.75 to	12.25
Axle turnings	7.00 to	7.50
Acid Open-Hearth Grades:		
Steel couplers and knuckles	9.75 to	10.25
Coil springs	11.50 to	12.00
Electric Furnace Grades:		
Axle turnings	7.50 to	8.00
Low phos. punchings	10.75 to	11.25
Low phos. plates, 12 in. and under	10.50 to	11.00
Blast Furnace Grades:		
Cast iron borings	3.75 to	4.00
Short shoveling turnings	3.50 to	4.00
Machine shop turnings	3.50 to	4.00
Rolling Mill Grades:		
Rerolling rails	10.50 to	11.00
Cupola Grades:		
Steel rails, less than 3 ft.	10.75 to	11.25
Steel rails, less than 2 ft.	11.75 to	12.25
Angle bars, steel	10.00 to	10.50
Cast iron carwheels	8.75 to	9.25
Malleable Grades:		
Railroad	10.25 to	10.75
Agricultural	9.75 to	10.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	19.00 to	21.00
*Relaying rails, 65 lb. and heavier	22.00 to	27.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	9.50 to	10.00
Iron arch bars and transoms	10.50 to	11.00
Iron car axles	17.50 to	18.50
Steel car axles	11.50 to	12.00
No. 1 railroad wrought	7.50 to	8.00
No. 2 railroad wrought	7.75 to	8.25
No. 1 busheling	6.00 to	6.50
No. 2 busheling	4.00 to	4.50
Locomotive tires, smooth	11.50 to	12.50
Pipes and flues	5.50 to	6.00
Cupola Grades:		
No. 1 machinery cast	9.00 to	9.50
No. 1 railroad cast	8.00 to	8.50
No. 1 agricultural cast	7.00 to	7.50
Stove plate	6.25 to	6.75
Grate bars	6.25 to	6.75
Brake shoes	6.50 to	7.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

CLEVELAND

Steel Orders Show a Slight Downtrend But Operations Are Unchanged

CLEVELAND, May 12.—Demand for finished steel shows a slight downward trend this month as compared with April. Business from the automotive industry fell off somewhat the past week, and it seems doubtful if present production in that field will be maintained in June.

Operations of Cleveland steel plants remain at 56 per cent of ingot capacity, this being the fifth consecutive week in which there has been no change in operations. Finishing mill operations are spotty. While there was some curtailment by local mills this week, the Empire Steel Corpn. resumed operations at its Falcon plant at Niles. The percentage of operation of independent sheet and strip mills shows little change from a week ago. Some of the Ohio forge shops making automotive parts have curtailed slightly.

Consuming industries outside of the automotive field show little change. Steam shovel makers in Ohio continue operations at near peak and have a good volume of business on their books. While business is dull with road scraper manufacturers, these look forward to a good volume of orders later in the season owing to the large amount of highway work that is to be placed.

Steel requirements in structural material and reinforcing bars for highway bridge work are quite satisfactory, but little new building work is coming out.

Prices appear to be well maintained on most products. A concession on alloy steel bars, previously granted to leading automobile manufacturers, has been extended to some of the forge shops making automobile parts. Some of the mills will attempt to advance hot-rolled strip $1 a ton for the third quarter, claiming that they cannot operate profitably at the present prices.

IRON ORE

Lake vessel rates on ore that prevailed last year have been reestablished for the present season. The rates are 70c. a gross ton from the head of Lake Superior to lower Lake ports, 63c. from Marquette and 52½c. from Escanaba. The rate from the last-named port to Lake Michigan ports is 42c. Dock balance of Lake Superior ore May 1 was 5,429,721 tons, compared with 4,330,929 tons at the same date last year. Shipments to these ports in April were 355,449 tons, compared with 770,460 tons during April last year.

PIG IRON

Sales and inquiry continue light. Most buying is of a hand-to-mouth character in small lots. The Westinghouse Electric & Mfg. Co. has not yet placed orders against its recent inquiry for its Cleveland and Trafford City plants. Shipping orders are holding up to the April volume. Little interest is shown in prices, which are steady at recent levels. Foundry and malleable iron are quoted at $16 to $17, Lake furnace, for Ohio and Indiana shipment, $17 to $17.50 for Michigan, and $17 for delivery in Cleveland.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$17.00
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.50
Ohio silvery, 8 per cent	25.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

SHEETS

Some good tonnage was placed by the motor car industry with Ohio mills during the week. However, the market in this territory was unusually dull. Confusion resulting from the new classification is evidently holding back some business. Additional mills have announced the adoption of the new system of classification. No sales are reported on the new basis, although some quotations have been made. One mill has named 2.50c., Pittsburgh, as the base price for No. 24 hot-rolled annealed sheets. Another has come out for the third quarter at the new prices on heavy and light cold-rolled, auto body and furniture sheets, but will accept business on the old basis to July 1. On black sheets, 2.15c., Pittsburgh, has become more common.

STRIP STEEL

Orders for hot-rolled strip from some of the makers of automobile accessories increased the past week, owing to the stepping up of production on accessories for Chevrolet cars, which necessitated the placing of additional specifications to cover requirements until about June 15. Demand from other consumers in the automotive field is holding to recent volume. The market is firm at 1.50c., Pittsburgh, for wide strip, 1.60c. for narrow and $1 a ton higher for small miscellaneous lots. Cold-rolled strip continues very dull. This grade is quoted at 2.15c., Cleveland, to large-lot buyers and at 2.25c. for small lots. Fender stock appears to be firm at 3.20c.

BARS, PLATES AND SHAPES

Orders for the heavier rolled steel products are confined to small lots, and the aggregate tonnage is light. Merchant bars are not moving so well as recently. However, reinforcing bars show more activity. Local grade elimination bridges, requiring 400 tons, were placed during the week, and State highway bridge work, aggregating 600 tons, is pending. Grade crossing elimination work in prospect in Detroit involves 4000 tons. Municipal water tanks in Columbus, Ohio, will take 700 tons of plates.

Concessions of $4 a ton to 2.45c., base, on alloy steel bars have been made to drop forge manufacturers in the automotive field, giving them the same price as had previously been granted to some of the larger motor car manufacturers. For consumers outside of the automotive industry it is stated that 2.65c., base, is being firmly maintained. Other prices are steady. Steel bars are generally quoted at 1.65c., Cleveland, for the outlying territory, including Michigan, and plates and shapes at 1.65c., Pittsburgh.

WAREHOUSE BUSINESS

The volume continues light. A price reduction in Detroit is expected to be followed by some downward revision on warehouse prices in Cleveland.

OLD MATERIAL

A Cleveland mill has purchased a round lot of machine shop turnings at a reported price of $6 a ton, and dealers are paying $5.50 for this grade. This is an advance of fully $1 a ton, the price having sagged sharply recently because, with no local demand, the trade had to look to outside mills for an outlet. Another Cleveland mill has released shipments of blast furnace scrap. Not much scrap is going to Valley district mills, which are regulating shipments. The market generally has a weak tone, but, aside from machine shop turnings, quotations are unchanged.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$9.75 to $10.25
No. 2 heavy melting steel	9.50 to 9.75
Compressed sheet steel	8.50 to 9.00
Light bundled sheet stampings	7.00 to 7.50
Drop forge flashings	7.50 to 8.00
Machine shop turnings	5.50
Short shoveling turnings	6.75 to 7.00
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	10.00 to 10.50
No. 1 busheling	8.00 to 8.50
Pipes and flues	5.50 to 6.00
Steel axle turnings	8.00 to 8.50
Acid Open-Hearth Grades:	
Low phos., billet bloom and slab crops	14.00 to 14.50
Blast Furnace Grades:	
Cast iron borings	6.25 to 6.75
Mixed borings and short turnings	6.25 to 6.75
No. 2 busheling	6.00 to 6.50
Cupola Grades:	
No. 1 cast	12.00 to 12.50
Railroad grate bars	6.00 to 6.50
Stove plate	6.00 to 6.50
Rails under 3 ft	15.00 to 15.50
Miscellaneous:	
Rails for rolling	13.00 to 13.50
Railroad malleable	12.00 to 12.50

NEW YORK

Steel Demand Barely Holding Its Own—Pig Iron Dull

NEW YORK, May 12.—Pig iron demand remains on a hand-to-mouth basis. Sales, at 4000 tons, are in virtually the same volume as in the previous week. The largest order reported was for 510 tons and some purchases were in less-than-carload lots. In the metropolitan district a number of the smaller foundries are buying a motor truckload at a time, preferring not to obligate themselves further during a period of scarcity of business and financial stress. Collections have become notably slower in the case of some of the smaller melters and even some of the larger companies are no longer discounting their bills.

Foundry operations are still spotty, with scattered signs of improvement offset by evidences of recession in other directions. Pig iron buying reflects the same uneven condition, with various groups of melters coming into the market for added needs from time to time while others are curtailing their operations. No sizable inquiries are before the trade. Eastern furnaces are active in competition in this district and eastern Pennsylvania, Alabama and Buffalo furnaces continue to be factors. No new price developments are reported.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$19.91 to $20.41
*Buff. No. 2, del'd east, N. J.	18.28 to 18.78
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	17.39 to 17.89
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

FINISHED STEEL

Sales of finished steel in this territory are barely holding their own. Some sellers report trade decidedly dull. The larger companies, with diversified products, find that the average of sales, taking all products, has been about the same during the past few weeks. There are occasional indications of a spurt in demand, but these generally turn out to be a further disappointment.

The structural steel market is fairly active, with an increase in small awards and inquiries, but in other products the amounts sought are usually quite small. The outstanding structural inquiry is for 6000 tons for Broadway Temple, Broadway at 174th Street, New York.

WAREHOUSE BUSINESS

Buying from stock is slightly better with most jobbers than in April, consumers of steel apparently preferring to cover the requirements of individual orders as they are received rather than to carry any stocks. Demand for structural material has declined, but sheets continue moderately active. Prices are fairly well maintained, with only occasional concessions on desirable orders.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Blue ann'l'd sheets (No. 10)	3.00c. to 3.25c.
Black sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

CAST IRON PIPE

Inquiry is generally for small lots of pressure pipe, and, with the market quiet, competition is keen. Recent business has been placed at from $31 to $33 a net ton, f.o.b. northern foundry. Contractors are inquiring for a small tonnage of pipe to install at Long Beach, N. Y., and there is an export inquiry current from the Far East for about 3000 tons of pipe in a wide range of sizes.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $33.90 to $35.90; 4-in. and 5-in., $36.90 to $38.90; 3-in., $43.90 to $45.90. Class A and gas pipe, $3 extra.

REINFORCING BARS

New projects requiring reinforcing bars are small, seldom requiring more than a carload. As a result, distributers are maintaining 1.65c. a lb., Pittsburgh, or 1.98c., New York, on most of the current business, concessions of $1 and $2 a ton appearing only on occasional projects calling for 100 tons or more. The only sizable award reported this week is 1500 tons of reinforcing bars for highway and bridge construction in New Jersey.

COKE

There are no indications of a revision of by-product foundry coke prices, despite recent weakness in some of the Connellsville brands. Foundry coke specifications continue to come out at a very slow rate. Furnace coke prices range from $2.25 to $2.50 a net ton, Connellsville, and standard beehive foundry coke at $3.25 to $3.50. Other coke quotations follow:

Special brands of beehive foundry coke, $4 to $4.85 a net ton, ovens, or $7.71 to $8.56, delivered to northern New Jersey, Jersey City and Newark, and $8.59 to $9.43 to New York and Brooklyn; by-product foundry coke, $9 to $9.40, Newark or Jersey City; $10.06, New York or Brooklyn.

OLD MATERIAL

Following purchase of a small tonnage of No. 1 heavy melting steel at $10, delivered, by a Coatesville, Pa., mill, brokers have reduced their buying price for eastern Pennsylvania to $9.50, delivered. A broker who was filling a contract in Buffalo by barge shipments of No. 1 steel has withdrawn from the market, although shipments are still going forward of material previously bought. An eastern Pennsylvania mill, with a low freight rate from this district, has bought about 2000 tons of No. 1 steel from a New Jersey yard at $9 a ton, delivered, and a small tonnage of this grade has been contracted for by a Worcester, Mass., user, at $8.50 a ton, delivered. Other grades of scrap are inactive, and buying prices are off about 50c. a ton, based on transactions in small lots, or offers by dealers and brokers.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel		$6.00
Heavy melting steel (yard)	$4.25 to	4.50
No. 1 hvy. breakable cast.	6.50 to	7.50
Stove plate (steel works)	4.25 to	4.50
Locomotive grate bars	4.25 to	4.50
Machine shop turnings		2.50
Short shoveling turnings		2.50
Cast borings (blast fur. or steel works)		2.50
Mixed borings and turnings	2.25 to	2.50
Steel car axles	12.50 to	13.00
Iron car axles	16.50 to	17.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)		6.75
Forge fire	5.50 to	6.00
No. 1 railroad wrought		8.75
No. 1 yard wrought, long		7.75
Rails for rolling	8.00 to	8.50
Stove plate (foundry)	4.75 to	5.25
Malleable cast (railroad)	8.50 to	9.00
Cast borings (chemical)	8.00 to	8.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$12.00 to	$12.50
No. 1 hvy. cast (columns, bldg. materials, etc.); cupola size)	10.00 to	10.50
No. 2 cast (radiators, cast boilers, etc.)	9.50 to	10.00

PHILADELPHIA

Blast Furnace to Go Out—New Low for Steel Scrap

PHILADELPHIA, May 12.—The trend of steel production in the eastern Pennsylvania district has been slightly downward for some weeks, and the average is now a little under 40 per cent, with the Bethlehem Steel Co. running at somewhat better rates than its competitors. Pig iron production will be reduced about June 1 by the blowing out of the Alan Wood Steel Co. furnace at Swedeland, Pa., for relining. Another furnace at the same location may be put in blast within 30 to 60 days. The Alan Wood company has suspended operations at its Oak Bluff mines. Ferromanganese output is also being reduced by the blowing out this week of the Oriskany furnace of E. J. Lavino & Co. at Reusens, Va.

Prices on plates, shapes and bars remain fairly steady despite the lack of adequate tonnage on mill order books. Sheet quotations, however, continue to show weakness. Most of the sheet producers expect to adopt the new classification recently announced, but probably will not make the change until the period for entering third quarter contracts, as a revision now would necessitate rewriting second quarter contracts.

The lowest price in heavy melting steel scrap in this district since 1896 has been reached in the purchase by a steel mill of 2000 tons at $9, delivered.

STEEL BARS

With most consumers covered for the rest of this quarter, buying is limited to occasional small lots, on which quotations range from 1.65c. to 1.70c. a lb., Pittsburgh, or 1.94c. to 1.99c., Philadelphia. Billet steel reinforcing bars are quoted at 1.65c. a lb., Pittsburgh, or 1.94c., Philadelphia, for carload lots and smaller, with concessions of $1 and $2 a ton on larger tonnages. Rail steel bars range from 1.20c. to 1.30c., Pittsburgh, or 1.49c. to 1.59c., Philadelphia. About 180 tons of reinforcing bars for the Berks County court house, Reading, Pa., have been awarded.

PIG IRON

Prices are unchanged at $16.50 to $17 a ton, furnace, for eastern Pennsylvania foundry iron, with most of the current business in carload lots for prompt shipment. The low bidder on furnishing 224 tons of low phosphorus iron for the Washington Navy Yard was Pilling & Co., Philadelphia, quoting on British iron, and the next lowest bid by Frank Samuel Co., Philadelphia, was also based on British iron. After July 1 pig iron of domestic origin will be specified on these purchases. The Delaware, Lackawanna & Western Railroad and the Seaboard Air Line are each in the market for a carload of foundry iron. Southern foundry iron is maintained at $11 a ton, Birmingham, and, with current business limited to small tonnages, there is evidently no inclination to grant concessions.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$17.26 to $17.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	17.76 to 18.26
East. Pa. No. 1X	18.26 to 18.76
Basic (del'd east. Pa.)	17.00 to 17.25
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.29
Va. No. 2X, 2.25 to 2.75 sil.	22.79

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

PLATES

About 300 tons of plates for a ferryboat have been awarded by the Pusey & Jones Co., Wilmington, Del., to the leading independent interest. Plate quotations are unchanged at 1.75c. a lb., Coatesville, Pa., or 1.85½c., Philadelphia, with occasional concessions of $1 a ton on the larger lots. Small miscellaneous specifications for prompt shipment occasionally bring 1.80c., Coatesville, or 1.90½c., Philadelphia.

SHEETS

Buying is generally limited to small orders for prompt shipment, but on medium-sized orders concessions are not unusual. Black sheet prices range from 2.15c. to 2.25c., Pittsburgh, or 2.44c. to 2.54c., Philadelphia, and galvanized from 2.80c. to 2.85c., Pittsburgh, or 3.09c. to 3.14c., Philadelphia. Distributers of galvanized sheets are usually granted a $2 reduction from the 2.85c., Pittsburgh, quotation. Blue annealed sheets, No. 13 gage, range from 1.95c. to 2c. a lb., Pittsburgh, or 2.24c. to 2.29c., Philadelphia, and blue annealed plates, No. 10 gage, are 1.85c. to 1.90c., Pittsburgh, or 2.14c. to 2.19c., Philadelphia.

SHAPES

Most consumers of shapes are protected at former prices, and only a small volume of new business is being placed at 1.75c., f.o.b. nearest mill to consumer, or 1.81c., Philadelphia. Concessions of $1 a ton are not uncommon on desirable business. Fabricating shops are in need of tonnage. The only sizable contract awarded in the past week was 2700 tons for the Berks County court house at Reading, Pa.

IMPORTS

In the week ended May 9, 7360 tons of iron ore arrived at this port from Tripoli and 2984 tons of pig iron was received from British India. Steel arrivals consisted of 489 tons of structural shapes and 15 tons of steel bars from Belgium and 4 tons of structural shapes and 19 tons of steel bars from Germany.

OLD MATERIAL

About 2000 tons of No. 1 heavy melting steel has been bought from a dealer at $9 a ton, delivered Bethlehem, Pa. This is said by the buyer to be the lowest price paid for this delivery since 1896. Other eastern Pennsylvania mills have been able to buy small lots of No. 1 steel at $10 a ton, delivered. Machine shop turnings, cast borings and stove plate are off 50c. a ton on recent purchases, and the general trend of prices on other grades is downward, based on dealers' offers to sell.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$9.00 to $10.00
No. 2 heavy melting steel	8.00 to 8.50
Heavy melting steel (yard)	7.50 to 8.00
No. 1 railroad wrought	11.00 to 11.50
Bundled sheets (for steel works)	6.50
Hydraulic compressed, new	8.00 to 8.50
Hydraulic compressed, old	7.00 to 7.50
Machine shop turnings (for steel works)	6.00 to 6.50
Heavy axle turnings (or equiv.)	9.50 to 10.00
Cast borings (for steel works and roll. mill)	6.50 to 7.00
Heavy breakable cast (for steel works)	10.50 to 11.00
Railroad grate bars	8.50
Stove plate (for steel works)	8.50
No. 1 low phos., hvy. (0.04% and under)	15.00 to 15.50
Couplers and knuckles	13.25 to 13.75
Rolled steel wheels	13.25 to 13.75
No. 1 blast f'nace scrap	5.50 to 6.00
Wrot. iron and soft steel pipes and tubes (new specific.)	11.50
Shafting	16.50 to 17.00
Steel axles	16.50 to 17.00
No. 1 forge fire	9.50 to 10.00
Cast iron carwheels	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Cast borings (for chem. plant)	13.00 to 14.00
Steel rails for rolling	12.00 to 13.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.50c. to 2.60c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ⅞-in. inclu.	2.90c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.50c.
†Galvanized sheets (No. 24)	3.95c.
Light plates, blue annealed (No. 10)	3.05c.
Blue ann'l'd sheets (No. 13)	3.20c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 40 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

BOSTON

Buying of Pig Iron and Scrap at Low Ebb—Prices Unsettled

BOSTON, May 12.—Buying of pig iron continues at low ebb. Sales the past week were not more than 1000 tons, in which Buffalo iron figured most prominently. Some weakness has appeared in No. 1X Buffalo iron prices through the elimination of the usual differential, sales having been reported at $16 a ton, furnace. There is no open inquiry in the market. Foundries are still holding up contract shipments. A slight increase in foundry coke deliveries does not indicate betterment in the iron melt, according to furnace representatives.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91	$20.91
*Buffalo, sil. 2.25 to 2.75	19.91	20.91
†Buffalo, sil. 1.75 to 2.25	19.28	20.28
†Buffalo, sil. 2.25 to 2.75	19.28	20.28
*Ala., sil. 1.75 to 2.25	20.11	20.61
*Ala., sil. 2.25 to 2.75	20.61	21.11
†Ala., sil. 1.75 to 2.25		16.75
†Ala., sil. 2.25 to 2.75		17.25

Freight rates: $4.91 all rail from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.
*All rail rate.
†Rail and water rate.

FINISHED STEEL

The Boston Bridge Works, Inc., was the low bidder on the Maine Androscoggin bridge, calling for 1200 tons of fabricated steel, but no award has been made. Lettings the past week included 600 tons for a Tufts College unit at Medford, Mass. Bids close May 15 on 200 tons of steel bars required by the Springfield, Mass., armory. A. D. Granger Co., New York, will replace boilers at the armory to cost $74,444.

REINFORCING STEEL

Recent lettings include 150 tons of rail steel bars for a Massachusetts State road and 150 tons in small tonnages. The outlook for business is somewhat better. Two local schools will require 400 tons, a gas company warehouse here calls for 350 tons, a Hartford, Conn., municipal hospital will take 125 tons, and a Smithsfield, R. I., warehouse a like amount. Billet steel bars from stock are: One to 5-ton lots, 3c. a lb., base; 6 to 99-ton lots, 2.40c.; 100-ton lots and larger, 2.30c. Rail steel bars are 2.26½c. a lb., delivered Boston rate points.

CAST IRON PIPE

Little business developed the past week, bookings having been confined to scattered car lots. The Bristol & Warren Water Works is to construct approximately 13 miles of 8 and 12-in. water line in Barrington, R. I. Wilton, N. H., will buy 2000 ft. of 12-in. pipe. The price situation is still unsettled.

OLD MATERIAL

The inactivity of scrap is accentuated by the withdrawal of the American Steel & Wire Co., Worcester, Mass., and the Bethlehem Steel Co. from the market. Fresh weakness has cropped out in stove plate prices. The usual price for this grade for New England delivery is $5, while for eastern Pennsylvania delivery it is $8, equivalent to $3.75 a ton, on cars shipping point. Chemical borings values also have slumped, being 90c. to $1.90 a ton lower than on May 1, the extent of the drop depending on point of delivery. Mixed borings and turnings do not now bring more than $1.75 a ton, on cars shipping point. On May 13 the Boston & Maine Railroad will close bids on 43 cars of miscellaneous material.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$5.00 to	$5.25
Scrap T rails	5.00 to	5.25
Scrap girder rails	4.00 to	4.25
No. 1 railroad wrought	7.00 to	7.50
Machine shop turnings	2.00 to	2.25
Cast iron borings (steel works and rolling mill)	2.00 to	2.25
Bundled skeleton, long	5.00 to	5.25
Forge flashings	5.00 to	5.25
Blast furnace borings and turnings	1.50 to	1.75
Forge scrap	5.00 to	5.25
Shafting	10.00 to	10.50
Steel car axles	11.00 to	12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	5.00 to	5.50
Rails for rolling	7.50 to	8.00
Cast iron borings, chemical	7.00 to	8.50
No. 2 cast	5.00 to	5.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$9.00 to	$10.00
No. 1 machinery cast	9.00 to	10.00
Stove plate	5.00 to	5.25
Railroad malleable	13.00 to	13.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.36½c.
Structural shapes—	
Angles and beams	3.36½c.
Tees	3.36½c.
Zees	3.36½c.
Soft steel bars, small shapes	3.26½c.
Reinforcing bars	3.11½c. to 3.26½c.
Iron bars—	
Refined	3.26½c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.

	Per Cent Off List
Machine bolts	60 and 5
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts	60 and 5
Cold-punched nuts	60 and 5
Stove bolts	70 and 10

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BIRMINGHAM

Steel Orders and Operations Decline—Pig Iron Dull

BIRMINGHAM, May 12.—Pig iron business is unimproved in the district. Melters are buying just as little as possible and shipments on contracts as a rule are limited to urgent requirements. Restrictions on shipments became pronounced about the middle of April and have prevailed since. The outlook for early improvement is not promising. Quotations for district delivery remain at $12 to $13. Active furnaces number 13, the same as for the past six weeks.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00 to	$13.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50 to	13.50
Basic	12.00 to	13.00

CAST IRON PIPE

Manufacturers of pressure pipe continue to report unsatisfactory conditions. Attractive tonnages are less frequent than usual at this time of year, and there has also been a decline in small routine business. Chicago and Bloomington, Ind., are to open bids this week on about 8000 tons.

FINISHED STEEL

A gradually downward tendency has been felt by steel manufacturers during the past two weeks. Business has not been up to the weekly volume that was steady over a period of several months. Demand for sheets has been slightly better than was expected. The Missouri-Pacific is reported to have placed a rail order for about 3500 tons with the Tennessee company. Fabricators of structural steel and reinforcing bars are booking very little, and prospects in the South are exceptionally lean. Plant operations of some will likely be curtailed at an early date. The Virginia Bridge & Iron Co. has booked 120 tons for the Alabama State Board of Administration for bridges in Etowah County. Two weeks ago the Tennessee company reduced open-hearth operations from 13 to 11. Gulf States Steel followed last week with a reduction from three to two.

COKE

Shipments are slow and demand light. There is practically no new business. The price is still $5.

OLD MATERIAL

Activity is slight, both as to buying and as to movement on contract.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$9.50 to	$10.00
Scrap steel rails		10.00
Short shoveling turnings		7.50
Cast iron borings	(No market)	
Stove plate		7.50
Steel axles	15.00 to	16.00
Iron axles		18.00
No. 1 railroad wrought		8.00
Rails for rolling	11.50 to	12.00
No. 1 cast		10.00
Tramcar wheels	11.00 to	11.25
Cast iron borings, chem.		13.50
Cast iron carwheels		11.00

ST. LOUIS

Tin Plate Demand Brightest Spot in Dull Steel Market

ST. LOUIS, May 12.—Improvement in the pig iron market, which May was expected to develop, has failed to materialize, and conditions are no better or no worse than during the last few months. Stocks of raw material in hands of melters in the district are quite low, and they should buy liberally when the demand for finished products develops a stronger tone than at present. The market is apparently firm, with prices unchanged, but the demand is insufficient to offer a real test.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

FINISHED STEEL

The Granite City Steel Co. is now operating at about 75 per cent of the capacity in its tin plate division, there being a steady demand from canners, and this is the brightest spot in a dull situation. The demand for blue annealed sheets also is reported to be fairly good, buying being on account of the development of the new oil fields in east Texas. Galvanized sheets and tank plates are in slow demand. There is little new business in structural shapes and the fabricators in the district are said to be operating at about 30 per cent of capacity. No new business in reinforcing bars was placed during the week.

OLD MATERIAL

Activity in the old material market is confined to buying by dealers to fill uncompleted contracts, but this volume is small. Dealers' prices are unchanged, as they have been unable to buy scrap iron at lower prices than now prevail.

Railroad lists: Chesapeake & Ohio, 5111 tons; Wabash, 1825 tons; Chicago, Burlington & Quincy, 550 tons; Ann Arbor, 254 tons; Missouri-Kansas-Texas, 100 tons; Chicago, Rock Island & Pacific, 60 carloads; Chicago & Eastern Illinois, 34 carloads; Nashville, Chattanooga & St. Louis, 6 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$8.25 to $8.75
No. 1 heavy melting or shoveling steel	8.00 to 8.50
No. 2 heavy melting or shoveling steel	7.50 to 8.00
No. 1 locomotive tires	10.00 to 10.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	9.00 to 9.50
Railroad springs	10.00 to 10.50
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.00 to 8.50
No. 1 busheling	5.75 to 6.25
Cast iron borings and shoveling turnings	5.50 to 6.00
Iron rails	8.00 to 8.50
Rails for rolling	10.00 to 10.50
Machine shop turnings	2.75 to 3.25
Heavy turnings	6.00 to 6.50
Steel car axles	12.00 to 12.50
Iron car axles	17.50 to 18.00
Wrot. iron bars and trans.	9.00 to 9.50
No. 1 railroad wrought	6.00 to 6.50
Steel rails, less than 3 ft	11.00 to 11.50
Steel angle bars	8.00 to 8.50
Cast iron carwheels	7.00 to 7.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	8.25 to 8.75
No. 1 railroad cast	8.50 to 9.00
Stove plate	7.00 to 7.50
Relay. rails, 60 lb. and under	16.00 to 16.50
Relay. rails, 70 lb. and over	20.00 to 21.00
Agricult. malleable	7.50 to 8.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stock	3.60c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.60c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.10c.
Galv. corrug. sheets	4.65c.
Structural rivets	4.15c.
Boiler rivets	4.15c.

	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60 and 10
Carriage bolts	60 and 10
Lag screws	60 and 10
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60 and 10
Less than 200 lb.	50 and 10
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60 and 10
Less than 200 lb.	50 and 10

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PACIFIC COAST

Steel Business Continues to Lag Far Behind Normal for Season

SAN FRANCISCO, May 9—(*By Air Mail*).—The usual spring pickup in demand for steel products on the Pacific Coast is lacking. Most of the sales and inquiries continue to involve small tonnages for quick delivery. The price structure is not firm.

BARS

Only one award in excess of 100 tons was reported. This calls for 300 tons of reinforcing steel for an apartment house on Franklin Street, Los Angeles, placed with an unnamed interest. About 8000 tons of business is pending. Bids are being taken on 350 tons for a hotel in Phoenix, Ariz., and on 200 tons for a library at Claremont, Cal. Bids will be opened May 20 on 420 tons for a viaduct on Sloat Boulevard, San Francisco. Prices on out-of-stock material in the San Francisco district continue firm at 2.60c., base, on carload lots. Los Angeles quotations are unchanged at 2.50c., base. The mill price for mild steel bars continues at 2.10c., c.i.f.

PLATES

The Consolidated Steel Corpn., Los Angeles, secured 1000 tons of plates for the University Mound pipe line in San Francisco. The Western Pipe & Steel Co. booked 344 tons of 12 to 16-in. welded steel pipe for a pipe line in the Kettleman Hill district. Bids on 35,000 tons for the Hetch Hetchy project have been postponed from May 6 to May 20. Bids will be opened in Washington on May 13 for two floating derricks involving 300 tons. One of these derricks is for Mare Island and the other for San Diego. The usual quotation on plates is 2c., c.i.f.

SHAPES

The bulk of the business being booked by fabricators consists of lots ranging from 40 to 80 tons. Among the larger lots placed were 500 tons for the Kress Store, Sacramento, Cal., and 300 tons for a high school in Santa Barbara, both secured by the Minneapolis-Moline Power Implement Co. The Consolidated Steel Corpn. took 200 tons for the Mutual State Building, Los Angeles. The Herrick Iron Works was low bidder on 175 tons for a warehouse for the Port Commission, Oakland, and the Virginia Bridge & Iron Co. was low on 1200 tons for the Sixth Street viaduct, Los Angeles. No new inquiries of importance developed during the week. Shapes range from 2.05c. to 2.15c., c.i.f.

Pig iron prices per gross ton at San Francisco:

*Utah basic	$22.00 to $24.00
*Utah fdy., sil. 2.75 to 3.25	22.00 to 24.00
**Indian fdy., sil. 2.75 to 3.25	22.00 to 24.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

CAST IRON PIPE

Awards were confined to lots of less than 100 tons. Bids have been opened on 992 tons of 2 to 12-in. pipe for the Hoover Dam project. San Diego opened bids this week on 100 tons of 6-in. Class C pipe. New inquiries are slow in coming forth, and the tonnage booked so far this year, aggregating 30,646 tons, is 8000 tons below the total for the same period last year.

SHEETS

Little of importance has transpired recently in this market. Sales and inquiries call for small lots for prompt shipment. Blue annealed sheets are quoted at 2.50c., base, c.i.f., while black and galvanized sheets are quoted at 3c. and 3.50c., base, c.i.f., respectively.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	2.50c.
Soft steel bars	2.50c.
Black sheets (No. 24)	4.15c.
Blue ann'l'd sheets (No. 10)	3.05c.
Galv. sheets (No. 24)	4.65c.
Struc. rivets, ½-in. and larger	5.06c.
Com. wire nails, base per keg	$3.35
Cement c't'd nails, 100 lb. keg	3.35

CINCINNATI

Pig Iron Demand Declines—Steel Operations Fairly Steady

CINCINNATI, May 12.—The usual seasonal decline in demand for pig iron was discernible in sales in this district last week. Furnace representatives report orders totaling about 1500 tons, the largest amount having been 100 tons of Northern foundry iron for a Dayton consumer. Local foundries continue to operate at a very low rate, and the immediate prospects are not encouraging, since activity in other metal-working industries has shown no appreciable improvement. Prices on Southern foundry iron continue to be reasonably firm at an $11 Birmingham base. Prices on Northern iron in the competitive areas reflect the strong fight for business and show some fluctuations.

Prices per gross ton, deliv'd Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

COKE

Reflecting the continued quietness of the local pig iron market, foundry grades of coke are not quite as active this month as last. Oven representatives report that shipments have slackened from the level of April, and new business continues to be negligible.

FINISHED STEEL

Demand for sheets in the Cincinnati area declined slightly during the past week, but current orders are still a little above the 50 per cent level. Production continues at the rate that has prevailed for some weeks. The usual seasonal uptrend in orders from the road construction field has tended to take up some of the slack in other lines. The fabricated steel market is still dull.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.35c.
Cold-fin. rounds and hex	3.80c.
Squares	4.30c.
Black sheets (No. 24)	3.90c.
Galvanized sheets (No. 24)	4.40c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100 lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$16.50
4-in.	34.50
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00

OLD MATERIAL

With only two of the local mills taking scrap on contract at a slow rate, the old material market is quiet and featureless. New business is small and infrequent, and local dealers are conservative in both purchases and sales. The Chesapeake & Ohio, the Southern and the Louisville & Nashville railroads have published their usual lists.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$8.75 to	$9.25
Scrap rails for melting	10.25 to	10.75
Loose sheet clippings	4.50 to	5.00
Bundled sheets	7.75 to	8.25
Cast iron borings	4.75 to	5.25
Machine shop turnings	5.00 to	5.50
No. 1 busheling	7.25 to	7.75
No. 2 busheling	4.25 to	4.75
Rails for rolling	11.50 to	12.00
No. 1 locomotive tires	9.50 to	10.00
No. 2 railroad wrought	8.75 to	9.25
Short rails	13.25 to	13.75
Cast iron carwheels	10.50 to	11.00
No. 1 machinery cast	12.50 to	13.00
No. 1 railroad cast	11.50 to	12.00
Burnt cast	6.00 to	6.50
Stove plate	6.00 to	6.50
Brake shoes	6.00 to	6.50
Agricultural malleable	11.00 to	11.50
Railroad malleable	12.00 to	12.50

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YOUNGSTOWN

Slight Improvement in Specifications Checks Steel Decline

YOUNGSTOWN, May 11.—Some of the larger steel companies in the Valleys have noticed a slight improvement in specifications since the first of the month, and most of them believe that the downward trend in orders, which began several weeks ago, has been definitely checked. Local consumers of steel products, particularly fabricators of building materials, have increased their orders considerably, and demand for automotive steel has held up except in the case of a few producers. Wire products and reinforcing bars are moving fairly well and makers of pipe are more optimistic about prospects than they have been for some time. While Valley mills have not shared heavily in recent pipe line awards, a number are in the offing which may go to Youngstown producers. In the meantime, pipe production has fallen off, and this has had an influence on raw steel production in the district.

Open-hearth production last week fell to the lowest levels since the beginning of the year, with hardly more than a third of the district's theoretical capacity in operation. No further curtailment is expected this week, and gains may be registered at some plants. A steel company blast furnace supplying a local mold plant has been banked and a merchant stack is scheduled to go out before the end of the month. Steel works stacks in production are more than sufficient to supply the comparatively light requirements of open-hearth departments.

Finishing mill operations, particularly where flat-rolled steel production is concerned, are generally intermittent and difficult to gage. Many sheet units are only producing every other week and strip mills are not averaging more than two or three days a week. Tin plate production has been maintained thus far at Warren, but curtailment can be expected in the near future in view of declining specifications for the industry as a whole. Bar mill operations are holding at about 45 per cent of capacity, with the leading interest maintaining a somewhat better rate than the independents. Demand for alloy steel bars is constant, but at a reduced rate. Cold-finishing mills are engaged at about one-third of theoretical full, but makers report an increase in the number of orders placed, despite their small size. This tendency is reflected also in demand for other forms of steel and shipments are as well diversified as they have been since the first of the year. So far as mills are able to judge, the stocks of manufacturing consumers are very low, far under normal needs, and only the fact that mills are able to make such prompt deliveries enables steel users to carry on their operations under such schedules.

Steel prices are in a state of some uncertainty, but the small size of current orders precludes the possibility of price concessions in many cases. Bars are fairly well established at 1.65c., Pittsburgh, and minimum prices on hot-rolled strip continue at 1.50c. and 1.60c., Pittsburgh. Some business is being taken at $1 a ton higher. The price structure on sheets has not yet been thoroughly ironed out, following the adoption of the new schedules announced recently by the American Rolling Mill Co. Leading Valley mills have signified their intention of adopting the new schedules and are busily engaged in adjusting their business to the new basis. It is unlikely that the new arrangement will be fully effective until the beginning of the third quarter.

The market on raw material is unusually dull, with sales of pig iron confined to minimum tonnages and little demand for scrap. The asking prices of scrap dealers have reflected weakness at Pittsburgh and other centers, and No. 1 heavy melting steel and hydraulic compressed sheets are both nominally quoted at $11 to $11.50. No recent sales have been made to establish the market.

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Swiss Aluminum Sold in Japan

YOKOHAMA, JAPAN, April 8.—Aluminum sheets of European origin recently have been offered in this market, principally by a Swiss manufacturer, at better prices than are obtainable from American sellers. Consumers here believe that the European product may prove to be a formidable competitor of American aluminum and may result in lower prices.

BUFFALO

Pig Iron Prices for District Delivery Reduced 50c. a Ton

BUFFALO, May 12.—The only development of importance in the pig iron market was the reduction in district prices of 50c. a ton to $17 a ton for No. 2 plain, $17.50 for No. 2X foundry and malleable and $18.50 for No. 1X. The new prices have not resulted in any large commitments.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

FINISHED STEEL

The Lackawanna plant of the Bethlehem Steel Co. probably will operate 14 open-hearths this week in place of 16 last week. Republic Steel continues to operate three, Wickwire Spencer three and Gould Coupler one. The Seneca Iron & Steel Co. is operating at about 50 per cent. Fabricated structural and reinforcing bar business is quiet.

OLD MATERIAL

Another order of No. 1 and No. 2 heavy melting steel has been placed by the leading consumer at $10.50 for No. 1 and $9 for No. 2. It is understood that about 5000 tons was purchased and that this was distributed among three or four dealers. None of the material in the recent railroad lists came to Buffalo. One of the roads was offered $10.35, delivered Buffalo, for its No. 1 heavy melting steel.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$10.50
No. 2 heavy melting scrap		9.00
Scrap rails	11.00 to	11.50
Hydraul. comp. sheets		9.00
Hand bundled sheets	8.00 to	8.50
Drop forge flashings		9.00
No. 1 busheling		9.00
Hvy. steel axle turnings	8.50 to	9.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	9.00 to	9.50
Acid Open-Hearth Grades:		
Knuckles and couplers	12.50 to	13.00
Coil and leaf springs	12.50 to	13.00
Rolled steel wheels	12.50 to	13.00
Low phos. billet and bloom ends	13.00 to	14.00
Electric Furnace Grades:		
Short shov. steel turnings	6.75 to	7.25
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling		6.00
Rolling Mill Grades:		
Steel car axles	15.00 to	15.50
Iron axles	16.00 to	16.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.15c.
Reinforcing bars	2.95c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.60c.
Bands	3.50c.
Hoops	3.90c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.60
Black wire, base per 100 lb.	3.20

Cupola Grades:	
No. 1 machinery cast	10.00 to 10.50
Stove plate	8.50 to 9.00
Locomotive grate bars	7.50 to 8.00
Steel rails, 3 ft. and under	13.00 to 13.50
Cast iron carwheels	11.50 to 12.00
Malleable Grades:	
Industrial	11.00 to 12.00
Railroad	11.00 to 12.00
Agricultural	11.00 to 12.00
Special Grades:	
Chemical borings	9.00 to 9.50

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Canada

Iron and Steel Operations Are Tapering Off

TORONTO, May 12.—Operations are tapering off in the Canadian iron and steel industry, and further curtailment is expected as summer approaches. A good deal of the activity of the past few months was due to railroad orders, but as these are now being completed the outlook is not promising. The Algoma Steel Corpn. plant at Sault Ste. Marie, Ont., will reach the end of its rail orders in about a month, and the rail mill may be shut down, releasing nearly 500 men.

PIG IRON

A slowing down in demand for pig iron reflects the uncertainty as to the immediate business outlook. No contracts have been placed recently for forward delivery. Orders placed in the past week were for this quarter only. Only four of the 11 furnaces in Canada are in blast. Imports are much below normal owing to slackness in the agricultural implement industry. Prices are unchanged, and it is stated that competition from American pig iron producers is negligible.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	20.50

OLD MATERIAL

Consumers of scrap are buying sparingly. Movement of heavy melting steel and turnings is confined to small lots. There is a fair demand for machinery cast and other foundry grades. Prices are unchanged.

Dealers' buying prices for old material:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	....	10.00
Stove plate	....	8.00
Standard carwheels	....	8.50
Malleable	....	8.00
Per Net Ton		
No. 1 mach'ry cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

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Wide Flange Structural Sections Standardized

A notable movement toward full standardization, and the companion development of simplification, has been made in structural shapes. New shape books now in process of distribution by the Carnegie Steel Co., the Bethlehem Steel Co. and the Illinois Steel Co. show that these three producers of wide flange sections have determined on rolling such shapes in identical heights and weights and with such similarity in cross-section as to give almost precisely the same section properties, the properties that have to be taken into consideration in the design of a steel bridge or building.

What this large step in standardization means to the fabricating trade in the elimination of overlapping and in the interchangeability of shapes of the different manufacturers is clear. What it will mean in the reduction of the number of sizes that need to be carried in stock is similarly obvious.

From the United States Steel Corpn. it is learned that its present line of CB beams will not be obtainable after July 1, so that fabricators counting on them in projects now under way will have to send in their orders forthwith. After July, adherence will be strictly to the new line of shapes.

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German Scrap Prices Lowest Since War

BERLIN, GERMANY, April 29.—Prices for all grades of scrap have been reduced 1 m. to 2 m. (24c. to 48c.) a ton by the German Association of Scrap Merchants. The scrap market is now at the lowest point in post-war years, with No. 1 heavy melting steel selling at 25.50 m. ($6.07) a ton, turnings at 17.50 m. ($4.16) a ton, and bundled black sheet cuttings at 20.50 m. ($4.88) a ton.

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Grindle Fuel Equipment Co., subsidiary of the Whiting Corpn., Harvey, Ill., has purchased the exclusive manufacturing and selling rights to the Bethlehem pulverizer, formerly manufactured by the Bethlehem Steel Co.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$30.00
Rerolling, 4-in. and under 10-in., Youngstown	30.00
Rerolling, 4-in. and under 10-in., Cleveland	30.00
Rerolling, 4-in. and under 10-in., Chicago,	31.00 to 32.00
Forging quality, Pittsburgh	36.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$30.00
Youngstown	30.00
Cleveland	30.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$30.00
Youngstown	30.00
Cleveland	30.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.65c.
Universal	1.65c.
Sheared	1.65c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00 to $37.00
Cleveland	35.00 to 37.00
Chicago	35.00 to 37.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 27c.
Manganese ore, African or Indian, 50 to 52%	24c. to 26c.
Manganese ore, Brazilian, 46 to 48%	22c. to 24c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50

	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3 crude, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40 to $2.50
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.75
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.40 to 1.50
Gas coal, 3-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	75c. to 85c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic 80% seaboard	*$80.00 to $85.00
Foreign, 80% Atlantic or Gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	39.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$19.00 to $21.00	11%	$22.00 to $24.00
7%	19.50 to 21.50	12%	23.00 to 25.00
8%	20.00 to 22.00	13%	25.00 to 27.00
9%	20.50 to 22.50	14%	27.00 to 29.00
10%	21.00 to 23.00	15%	29.00 to 31.00

Delivered prices at Chicago are about 50c. a ton below this schedule.

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	122.50
Silico-manganese, gross ton, delivered	135.00

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$14.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

Per 1000 f.o.b. Works

	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00 to $43.00	$32.00 to $35.00
Maryland	40.00 to 43.00	32.00 to 35.00
New Jersey	40.00 to 43.00	.....
Ohio	40.00 to 43.00	32.00 to 35.00
Kentucky	40.00 to 43.00	32.00 to 35.00
Missouri	40.00 to 43.00	32.00 to 35.00
Illinois	40.00 to 43.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago	49.00
Birmingham	47.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73
†Carriage bolts	73
Lag bolts	73
Plow bolts, Nos. 1, 2, 3 and 7 heads	73
Hot-pressed nuts, blank or tapped, square	73
Hot-pressed nuts, blank or tapped, hexagons	73
C.p.c. and t. square or hex. nuts, blank or tapped	73
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73
Semi-finished hexagons castellated nuts, S.A.E.	73
Stove bolts in packages, P'gh	80, 10, 10 and 5
Stove bolts in packages, Chicago	80, 10, 10 and 5
Stove bolts in packages, Cleveland	80, 10, 10 and 5
Stove bolts in bulk, P'gh	80, 10, 10, 5 and 2½
Stove bolts in bulk Chicago	80, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland	80, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.70c. to 1.80c.
Del'd Philadelphia	1.94c. to 1.99c.
Del'd New York	1.98c. to 2.03c.
F.o.b. Cleveland	1.65c. to 1.70c.
F.o.b. Lackawanna	1.75c. to 1.80c.
F.o.b. Birmingham	1.80c.
C.i.f. Pacific ports	2.25c.
F.o.b. San Francisco mills	2.25c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.65c.
F.o.b. Birmingham, mill lengths	1.75c. to 1.80c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c. to 1.35c.
F.o.b. Chicago Heights mill	1.60c. to 1.65c.
Del'd Philadelphia	1.84c. to 1.89c.

Iron

Common iron, f.o.b. Chicago	1.70c. to 1.80c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.70c. to 1.80c.
F.o.b. Birmingham	1.80c.
Del'd Cleveland	1.83½c.
Del'd Philadelphia	1.85½c.
F.o.b. Coatesville	1.75c. to 1.80c.
F.o.b. Sparrows Point	1.75c. to 1.80c.
F.o.b. Lackawanna	1.75c. to 1.80c.
Del'd New York	1.93c. to 1.98c.
C.i.f. Pacific ports	2.05c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.65c. to 1.70c.
F.o.b. Chicago	1.70c. to 1.80c.
F.o.b. Birmingham	1.80c.
F.o.b. Lackawanna	1.75c. to 1.80c.
F.o.b. Bethlehem	1.75c. to 1.80c.
Del'd Cleveland	1.83½c.
Del'd Philadelphia	1.76c.
Del'd New York	1.90½c. to 1.95½c.
C.i.f. Pacific ports	2.15c. to 2.25c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	1.60c. to 1.65c.
Wider than 6 in., P'gh	1.50c. to 1.55c.
6 in. and narrower, Chicago	1.70c. to 1.75c.
Wider than 6 in., Chicago	1.60c. to 1.65c.
Cooperage stock, P'gh	1.80c. to 1.90c.
Cooperage stock, Chicago	1.80c. to 1.90c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.15c. to 2.25c.
Strips, Cleveland	2.15c. to 2.25c.
Strips, deliv'd Chicago	2.43c.
Strips, Worcester	2.30c. to 2.40c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Base per Lb.
Bright wire	2.20c. to 2.30c.
Spring wire	3.20c. to 3.30c.

To Jobbing Trade

	Base per Lb.
Smooth annealed wire	2.35c. to 2.45c.
Smooth galvanized wire	2.80c. to 2.90c.
Polished staples	2.35c. to 2.45c.
Galvanized staples	2.60c. to 2.70c.
Barbed wire, galvanized	2.55c. to 2.65c.
Woven wire fence, per net ton	$60.00

	Base per Keg
Standard wire nails	$1.90 to $2.00
Smooth coated nails	1.90 to 2.00
Galvanized nails	3.90 to 4.00

To Retail Trade

	Base per Lb.
Bright wire	2.30c. to 2.40c.
Smooth annealed wire	2.40c. to 2.50c.
Smooth galvanized wire	2.90c. to 3.00c.

	Base per Keg
Standard wire nails	$2.00 to $2.10
Cement coated nails	2.00 to 2.10
Galvanized nails	4.00 to 4.10

	Base per Lb.
Polished staples	2.45c. to 2.55c.
Galvanized staples	2.70c. to 2.80c.
Barbed wire galvanized	2.65c. to 2.75c.
Woven wire fence per net ton	$65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Light Plates

Base per Lb.

No. 10, blue annealed, f.o.b. P'gh	1.85c.
No. 10, blue annealed, f.o.b. Chicago dist.	1.95c.
No. 10, blue an'l'd, del'd Phila.	2.14c. to 2.19c.
No. 10, blue annealed, B'ham	2.00c. to 2.05c.
No. 10, blue annealed, Pacific Coast ports	2.50c.

Sheets

Blue Annealed — *Base per Lb.*

No. 13, f.o.b. P'gh	2.00c.
No. 13, f.o.b. Chicago dist.	2.10c.
No. 13, del'd Philadelphia	2.29c.
No. 13, blue annealed, B'ham	2.15c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.15c. to 2.25c.
No. 24, f.o.b. Chicago dist. mill	2.35c.
No. 24, del'd Philadelphia	2.44c. to 2.54c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, c.i.f. Pacific Coast ports	3.00c.

Steel Furniture Sheets

No. 24, f.o.b. P'gh	3.40c. to 3.50c.

Galvanized

No. 24, f.o.b. Pittsburgh	2.80c.
No. 24, f.o.b. Chicago dist. mill	2.90c.
No. 24, del'd Cleveland	2.98½c.
No. 24, del'd Philadelphia	3.24c.
No. 24, f.o.b. Birmingham	2.80c. to 2.90c.
No. 24, c.i.f. Pacific Coast ports	3.50c.

Continuous Mill Sheets

No. 10 gage	1.70c.
No. 13 gage	1.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.55c. to 2.65c.
No. 28, f.o.b. Chicago dist. mill	2.65c. to 2.75c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.00c. to 3.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill:	
Unassorted	3.15c.
Assorted	3.25c.
Primes only	3.35c.

Vitreous Enameling Stock

No. 10, Pittsburgh (carloads)	3.10c.
No. 20, Pittsburgh (carloads)	3.60c.

Tin Plate

Base per Box

Standard cokes, f.o.b. P'gh district mills	$5.00
Standard cokes, f.o.b. Gary	5.10

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.45c. to 2.65c. per Lb.

S.A.E. Series Numbers	Alloy Differential
2000 (1½% Nickel)	$0.25
2100 (1½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flats)	0.25
Rounds and squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

Per Gross Ton

Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

Base per 100 Lb.

Spikes, ⅝ in. and larger	$2.70
Spikes, ½ in. and larger	2.70
Spikes, boat and barge	$2.90
Tie plate, steel	1.95
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49½	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 5%, and on galvanized by 1½ points, with supplementary discounts of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2½ in.—2¾ in.	16
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

FABRICATED STRUCTURAL STEEL

New Projects of 91,000 Tons Include 58,000-Ton Bridge—Awards Only 16,500 Tons

NEW projects requiring fabricated structural steel are in excess of 91,000 tons, comparing with 39,000 tons a week ago and 103,000 tons two weeks ago. This week's total is swollen by 58,000 tons for a bridge over the Mississippi River at New Orleans for the New Orleans Public Belt Railway. Other sizable inquiries include a building in New York for Broadway Temple, requiring 6000 tons, a city hall in St. Paul, Minn., 3000 tons, and a Post Office at Louisville, Ky., 2500 tons.

This week's inquiries bring the total of new projects reported in the 20 issues of THE IRON AGE this year to 1,248,000 tons, comparing with 582,000 tons in the same period of 1930 and 679,000 tons in 20 issues of 1929.

Awards are small this week, totaling about 16,500 tons, of which 3500 tons is for the Mellon Institute of Industrial Research, Pittsburgh, 2700 tons in the Berks County Court House, Reading, Pa., and 1000 tons in a bank building for Lansing, Mich. Awards follow:

North Atlantic States

MEDFORD, MASS., 600 tons, Tufts College unit, to New England Structural Co.

LISBON, ME., 100 tons, State bridge, to American Bridge Co.

BRUNSWICK, ME., 1275 tons, bridge, to Boston Bridge Works.

NEW HAVEN, CONN., 800 tons, Yale University building, to Pittsburgh Bridge & Iron Co.

NEW YORK, 900 tons, Loew's Theater at Seventy-second Street and Third Avenue, to Hinkle Iron Works.

NEW YORK, 500 tons, garage on Christopher Street, to Grand Iron Works.

NEW YORK, 400 tons, Greek church on East Seventy-fourth Street, to Bethlehem Fabricators, Inc.

NEW YORK, 250 tons, trade school building for Y.M.C.A., 15 West Sixty-third Street, to George A. Just.

NEW YORK, 230 tons, savings bank building on Amsterdam Avenue, to McClintic-Marshall Corpn.

BROOKLYN, 190 tons, Dime Savings Bank building, to McClintic-Marshall Corpn.

CHITTENANGO, N. Y., 135 tons, addition to high school, to Lackawanna Steel Construction Co.

FORT PLAIN, N. Y., 585 tons, highway bridge, to American Bridge Co.

BEACON, N. Y., 150 tons, Matteawan State Hospital, to Belmont Iron Works.

JERSEY CITY, N. J., 850 tons, building for Dickenson High School, to Schaefer Iron Works.

CAMDEN, N. J., 800 tons, Post Office, to American Steel Fabricators.

READING, PA., 2700 tons, Berks County Court House, to Baumann Iron Works.

CONSHOHOCKEN, PA., 180 tons, mill building, to Belmont Iron Works.

PENNSYLVANIA RAILROAD, 175 tons, bridge at Bristol, Pa., to Belmont Iron Works.

PITTSBURGH, 3500 tons, Mellon Institute of Industrial Research, to McClintic-Marshall Corpn.

PITTSBURGH, 425 tons, Twenty-eighth Street bridge over Pennsylvania Railroad, to American Bridge Co.

HEIDLERSBURG BOROUGH, PA., 285 tons, bridge, to McClintic-Marshall Corpn.

The South

HENDERSON, KY., 225 tons, bridge for Louisville & Nashville Railroad, to Missouri Valley Bridge & Iron Co.

STATE OF ALABAMA, 120 tons, bridge requirements in Etowah County, to Virginia Bridge & Iron Co.

MARION COUNTY, W. VA., 235 tons, Conoway bridge, to Bristol Steel & Iron Works.

Central and Northwest

CLEVELAND, 200 tons, warehouse for Strong, Carlisle & Hammond Co., to Kilroy Structural Steel Co.

CLEVELAND, 270 tons, Lorain and Chatham Avenue bridges for Cleveland Union Terminals Co., to McClintic-Marshall Corpn.

STATE OF OHIO, 400 tons, bridges for Pennsylvania Railroad, to American Bridge Co.

LANSING, MICH., 1000 tons, City National Bank, to Jarvis Engineering Co.

INDIANAPOLIS, 650 tons, grandstand, to Insley Mfg. Co.

KAUKAUNA, WIS., 300 tons, Lawe Street bridge, to Wisconsin Bridge & Iron Co.

MILWAUKEE, 800 tons, coal bridge for Milwaukee Electric Railway & Light Co., to Milwaukee Bridge Co.

PRAIRIE DU CHIEN, WIS., 1000 tons, bridge, to Pittsburgh-Des Moines Steel Co.

CHICAGO, 650 tons, steel joists for World's Fair exhibition building, to Truscon Steel Co.

WINNETKA, ILL., 800 tons, New Trier High School addition, to an unnamed bidder.

STATE OF MINNESOTA, 150 tons, highway bridge, to Lakeside Bridge Co.

ST. LOUIS, 215 tons, two quarter deck boat hulls, to St. Louis Structural Steel Co.

FORT CROOK, NEB., 300 tons, bridge, to Omaha Structural Steel Co.

Western States

SAN FRANCISCO, 1000 tons, plates, welded steel pipe line, University Mound, to Consolidated Steel Corpn.

SACRAMENTO, 500 tons, Kress store, to Minneapolis-Moline Power Implement Co.

SALINAS, CAL., 125 tons; 100 tons 10-in. H-columns and 25 tons of plain structurals, bridge over Chalone Creek, to Pacific Coast Steel Corpn.

SANTA BARBARA, CAL., 300 tons, high school, to Minneapolis-Moline Power Implement Co.

LOS ANGELES, 200 tons, Mutual State Building, to Consolidated Steel Corpn.

KETTLEMAN HILLS, CAL., 344 tons, plates, 12 to 16-in. welded steel pipe, to Western Pipe & Steel Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

BOSTON, 500 tons, city hospital building.

NEW YORK, 6000 tons, Broadway Temple at 174th Street and Broadway.

NEW YORK, 150 tons, apartment building at 244 Waverly Place.

NEW YORK, 175 tons, addition to building at 67 West Forty-fourth Street.

NEW YORK, 350 tons, public school No. 117 in Queens.

NEW YORK, 100 tons, addition to public school No. 52 at 650 Academy Street.

NEW YORK, 100 tons, building at Eighty-seventh Avenue and 114th Street, Jamaica.

BROOKLYN, 200 tons, alterations and addition to St. Patrick's School at Ninety-fifth Street and Fourth Avenue.

BROOKLYN, 900 tons, highway bridge at Metropolitan Avenue.

ELIZABETH, N. J., 1600 tons, Court House.

JERSEY CITY, N. J., 100 tons, school for Our Lady of Sorrows on Claremont Avenue.

SUMMIT, N. J., 100 tons, building for Kent Place school.

FORT LEE, N. J., 175 tons, field office building for Hudson River bridge.

VALHALLA, N. Y., unstated tonnage, addition to Elmwood Hall, Grasslands Hospital.

HOBOKEN, N. J., unstated tonnage, bakery.

WHITE PLAINS, N. Y., 100 tons, garage and shop for Westchester Lighting Co.

LONG BEACH, N. Y., 100 tons, theater.

BURLINGTON, N. J., 1000 tons, plant for Public Service Co. of New Jersey.

The South

LOUISVILLE, KY., 2500 tons, Post Office.

NEW ORLEANS, 58,000 tons, bridge across Mississippi River for New Orleans Public Belt Railway.

Central and Northwest

COLUMBUS, OHIO, 700 tons, booster water tank for city, Chicago Bridge & Iron Co., low bidder.

INDIANAPOLIS, 2100 tons, Indiana Bell Telephone Co. building.

CLEVELAND, 800 tons, building for American Multigraph Co.

COSHOCTON, OHIO, 300 tons, bridge for State highway department.

LA SALLE, ILL., 700 tons, bridge for Chicago, Burlington & Quincy.

CHICAGO, 1200 tons, Humboldt Park station for Commonwealth Edison Co.

CHICAGO, 700 tons, Chicago Avenue waterworks.

CHICAGO, 650 tons, mucking machines for city of Chicago; Midland Structural Steel Co., low bidder.

ST. PAUL, MINN., 3000 tons, City Hall.

LACROSSE, WIS., 750 tons, Wisconsin-Minnesota interstate bridge; bids close May 26.

STATE OF WISCONSIN, 1500 tons, State bridge work.

KENOSHA, WIS., 1700 tons, track elevation for Chicago & North Western.

STATE OF NEBRASKA, 800 tons, highway bridges.

Western States

SALT LAKE CITY, UTAH, 1500 tons, addition to Post Office.

SAN FRANCISCO, 35,000 tons, plates, Hetch Hetchy pipe line; bids postponed from May 6 to May 20.

MARE ISLAND, CAL., 300 tons, plates, two 25-ton floating derricks, one for Mare Island and one for San Diego; bids May 13 at Washington.

OAKLAND, CAL., 175 tons, warehouse for Port Commission; Herrick Iron Works, low bidder.

SACRAMENTO, CAL., 113 tons, bridge over north fork Trinity River; bids opened.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper and Tin Inactive —Lead Reduced—Zinc Advances

NEW YORK, May 12.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	May 12	May 11	May 9	May 8	May 7	May 6
Lake copper, New York	9.62½	9.62½	9.62½	9.62½	9.62½	9.62½
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Straits tin, spot, N. Y.	23.12½	23.25	....	23.25	23.25	23.40
Zinc, East St. Louis	3.27½	3.25	3.25	3.25	3.25	3.25
Zinc, New York	3.62½	3.60	3.60	3.60	3.60	3.60
Lead, St. Louis	3.60	3.60	3.65	3.65	3.80	3.80
Lead, New York	3.75	3.75	3.85	3.85	4.00	4.00

*Refinery quotation; price ½c. higher delivered in the Connecticut Valley.

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COPPER

Statistics for April, made public today, were by no means bullish. Predictions had been made that stocks of refined metal would show an increase over the previous month of at least 10,000 tons and the official data show the increase to be about 13,700 tons. There was a decrease, however, of over 4900 tons in blister stocks, making the increase in total copper above ground about 8800 tons. Announcement is also made this week of the closing down of two large American copper mining companies in the Southwest. In the last few months there has been a substantial decrease in copper production and stocks of refined metal have declined from about 605,000 tons on Oct. 30, 1930, to about 561,000 tons as of April 30.

Demand for copper continues very light, both from domestic and foreign buyers. Domestic demand is being met entirely by custom smelters at 9c., delivered in the Connecticut Valley, with now and then some metal sold at 9.25c. Primary producers continue to hold their quotation at 9.50c., and the asking price of Copper Exporters, Inc., is 9.77½c., c.i.f. usual European ports, as against 9.80c. last week, the difference being due to a slight reduction in freight rates. Foreign buyers are not active, and total export sales for the month thus far have been about 3700 tons, which is close to the volume of the corresponding period of the last two months. Lake copper is available at 9.50c. to 9.62½c., delivered.

TIN

Practically no business has been done in the past week, and there are no evidences of pressure to sell. The market is entirely a drifting one, with prices almost stationary here and abroad. In this market spot Straits tin has been hovering around 23.25c., New York, with the quotation today at 23.12½c. Today's London quotations are but little changed from those of a week ago, with spot standard quoted at £104 5s., future standard at £105 12s. 6d. and spot Straits at £106 7s. 6d. The Singapore market today was £107 5s. There was another large increase last week in stocks in British warehouses of 609 tons, with the total on May 9 at 28,616 tons. Shipments from the Straits are also large, the total at the end of last week having been 2907 tons. Announcement is made of a meeting of the International Tin Producers' Association at The Hague on May 16 to discuss a plan of further restriction of output from the present one of 22½ per cent to one of 33 per cent. In this market this is not regarded as large enough.

LEAD

Two more reductions by the leading interest bring the price of lead to 3.75c., New York, the lowest level since 1915. The corresponding quotation in the West is now 3.60c., the differential being only 15 points instead of 20 a week ago and 25 points early this year. The reductions have not increased demand appreciably, which is still confined to the immediate needs of consumers. There has been a little buying of June metal.

ZINC

This market has apparently turned the corner. The conviction has been discernible for several days that 3.25c., East St. Louis, was the bottom, and inquiries today for two or three substantial lots have lifted the market to 3.27½c., with some companies asking 3.30c. The corresponding New York quotation is 3.62½c. The ore market at Joplin has been firm for several days at $20 and buyers were able to purchase only about half

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New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	16.75c.
*Copper, hot rolled, base sizes	19.37½c.
Seamless Tubes—	
Brass	19.67½c.
Copper	22.87½c.
Brass Rods	15.00c.
Brazed Brass Tubes	25.12½c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.00c. to 9.50c.
Zinc sheets, open	10.00c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	25.00c. to 26.00c.
Tin, bar	27.00c. to 28.00c.
Copper, Lake	10.75c. to 11.25c.
Copper, electrolytic	10.50c. to 11.00c.
Copper, casting	10.25c. to 10.75c.
Zinc, slab	4.50c. to 5.50c.
Lead, American pig	4.75c. to 5.75c.
Lead, bar	6.75c. to 7.75c.
Antimony, Asiatic	9.50c. to 10.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	24.00c. to 25.00c.
Alum. ingots, No. 12 alloy	23.00c. to 24.00c.
Babbitt metal, commercial grade	25.00c. to 35.00c.
Solder, ½ and ½	18.00c. to 19.00c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	27.25c.
Tin, bar	29.25c.
Copper, Lake	10.88c.
Copper, electrolytic	10.88c.
Copper, casting	10.25c.
Zinc, slab	5.50c.
Lead, American pig	4.90c. to 5.00c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	33.00c.
Solder, ½ and ½	19.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.00c.	8.00c.
Copper, hvy. and wire	6.75c.	7.75c.
Copper, light and bottoms	5.75c.	6.50c.
Brass, heavy	3.75c.	4.75c.
Brass, light	3.25c.	4.25c.
Hvy. machine composition	5.75c.	6.75c.
No. 1 yel. brass turnings	4.25c.	4.75c.
No. 1 red brass or compos. turnings	5.50c.	6.25c.
Lead, heavy	2.50c.	3.00c.
Zinc	1.25c.	1.75c.
Sheet aluminum	10.00c.	12.00c.
Cast aluminum	5.00c.	7.50c.

of their requirements last week. The tone in this market is decidedly better.

ANTIMONY

Chinese metal is a little lower, due to some desire to sell, but with little inclination among buyers to make purchases. Prompt metal is quoted at 6.60c. a lb., New York, duty paid, with futures about 10 points lower.

NICKEL

Electrolytic cathodes are quoted at 35c. a lb., with shot and ingot nickel made from remelted electrolytic at 36c. a lb. for single lots of spot metal.

ALUMINUM

Virgin metal, 98 to 99 per cent pure, is obtainable at the published price of 22.90c. a lb., delivered.

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Railroad Equipment

Central of New Jersey is inquiring for five locomotive tenders.

Board of Transportation, New York, has placed contract with Magor Car Corpn. for six trailer flat cars, six air dump cars, two motor flat cars, one trailer supply car and one emergency pump car. The board is preparing a list to be awarded in July for 300 or more steel passenger cars for subway service.

Wheeling & Lake Erie is inquiring for 200 65-ft. gondola cars.

Great Northern is in the market for 500 superstructure sets for box cars that are to be built in its own shops.

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Detroit Scrap Market Shows Gains and Losses

DETROIT, May 12.—The scrap market continues to drag bottom, with steel plant grades especially dull. Borings and turnings have increased 25c. a ton on the strength of sizable transactions in the Pittsburgh district, but No. 1 machinery cast and hydraulic bundles have declined 50c. and 25c. a ton respectively. Sheet clips and flashings also show a weaker tendency.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$8.00 to	$8.50
Borings and short turnings	3.75 to	4.25
Long turnings	3.00 to	3.50
No. 1 machinery cast	8.50 to	9.00
Automotive cast	11.00 to	11.50
Hydraul. comp. sheets	7.25 to	7.75
Stove plate	6.50 to	6.75
New No. 1 busheling	6.50 to	7.00
Old No. 2 busheling	2.50 to	3.00
Sheet clippings	4.50 to	5.00
Flashings	6.75 to	7.25

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E. D. Giberson & Co., merchants of steel tubing and representatives of the Wrought Iron Co. of America, have moved the New York office of the company from 40 Rector Street to 90 West Street.

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Waldo, Egbert, Maltby & Ward, Inc., broker in pig iron, coal, coke ferrosilicon and other raw materials, has removed its Pittsburgh offices from the Union Trust Building to the Oliver Building.

Reinforcing Steel

Pending Projects Gain in Volume—Awards Also Larger

LETTINGS of reinforcing steel the past week, at 6000 tons, were in excess of those of the previous week, which totaled 4800 tons. The two largest contracts call for 1500 tons for State bridge and highway construction in New Jersey and 1000 tons for State road work in Illinois. About 8300 tons will be added to new jobs, 3000 tons of which is for 150 miles of highways and bridges in Illinois, 1200 tons for a Nurses' Home in Chicago and 1100 tons for college buildings in Alton, Ill. Awards follow:

STATE OF MASSACHUSETTS, 150 tons, road work at Fall River, to Northern Steel Co.

READING, PA., 180 tons, Berks County Court House, to Concrete Steel Co.

LANSING, MICH., 160 tons, interceptor sewer, to Capitol Steel Corpn.

STATE OF NEW JERSEY, 1500 tons, bridge and highway construction, George F. Brewster, general contractor, to Fairmont Iron & Steel Co.

STATE OF NEW JERSEY, 450 tons, highway construction in Bergen County, to Igoe Brothers.

WASHINGTON, 120 tons, National Capital Press building, to Capital Fireproof Products Corpn.

CLEVELAND, 400 tons, Lorain and Chatham Avenue bridges for Cleveland Union Terminals Co., to Truscon Steel Co.

NILES CENTER, ILL., 150 tons, Petrolargar Laboratories, to Calumet Steel Co.

WINNETKA, ILL., 135 tons, New Trier High School addition, to an unnamed bidder.

CHICAGO, 800 tons, outer bridge, distributed among three dealers.

EAST ST. LOUIS, ILL., 550 tons, approach to St. Louis municipal bridge, to Laclede Steel Co.

ROCKFORD, ILL., 100 tons, bridge, to Kalman Steel Co.

SPRINGFIELD, ILL., 1000 tons, State road work, distributed among five dealers.

LOS ANGELES, 300 tons, apartment building, 6283 Franklin Street, to an unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 400 tons, two schools.

BOSTON, 350 tons, Jamaica Plain district, Boston Consolidated Gas Co. warehouse.

SMITHFIELD, R. I., 125 tons, warehouse.

HARTFORD, CONN., 125 tons, municipal hospital.

CLEVELAND, 350 tons, Columbus Road bridge for Cuyahoga County; bids taken May 15.

CLEVELAND, 190 tons, Wolf Road bridge, general contract placed with Hecker-Moon Co.

WILLOUGHBY, OHIO, 100 tons, State highway bridge; bids taken May 19.

CHICAGO, 1200 tons, Cook County Hospital Nurses' Home.

SPRINGFIELD, ILL., 3000 tons, 150 miles of highway with bridges and culverts.

ALTON, ILL., 1100 tons, Principia College buildings.

PHOENIX, ARIZ., 350 tons, hotel; bids being taken.

PASADENA, CAL., 100 tons, newspaper building; bids being taken.

CLAREMONT, CAL., 200 tons, library for Claremont College; bids being taken.

SACRAMENTO, 148 tons, paving in San Joaquin County; bids May 27.

SACRAMENTO, 114 tons, undergrade crossing, San Mateo County; bids May 20.

SAN FRANCISCO, 255 tons, Hetch Hetchy pipe line; bids postponed from May 6 to 20.

SAN FRANCISCO, 420 tons, viaduct, Sloat Boulevard; bids May 20.

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Steel Road Guard Uses Columns and Plates

AN all-steel road guard has been developed in the research department of the American Institute of Steel Construction, New York, supervised by Lee H. Miller. It was this organization that originated battle-deck flooring for use in buildings. The new road guard has 6-in. steel H-columns, to which are bolted brackets carrying a guard rail of ¼ or 3/16-in. steel plates, 8 in. wide. The columns may be driven into the ground with a light, portable pile driver.

On level ground, the posts are driven vertically and the brackets may be bolted to the posts with vertical adjustment through extra holes punched in the flanges. When there

is an embankment and insufficient earth to hold the posts, they may be toed in at an angle, which it is claimed will insure ample earth resistance.

Where the inclined post is used, the holes in the post flanges provide vertical and horizontal adjustment, and holes in the vertical face of the bracket permit additional vertical adjustment. Such adjustment provides ample latitude for inaccurate driving. When the road is on rock, or a rock fill, holes must be made for any type of post used, but the steel H-column provides better opportunity to grout with concrete than solid posts, it is pointed out.

At one end of the guard plate the holes are 13/16 in. in diameter for ¾-in. bolts, and at the other end there are 1¼ or 1½-in. slotted holes to correct inaccuracy of driving on various road grades. When the bolts are drawn tightly, flexibility of the plate itself and the friction between plates at the large holes is said to serve as a means of taking up sharp impact stresses. Both plates and brackets have the strength and flexibility to meet service conditions without serious injury to the post and when plates or brackets are bent while in use, they may be cold-straightened or replaced by new parts on the original posts, it is stated.

Foundrymen Hold 35th Annual Meeting

(*Concluded from page* 1607)

rologist, who made an impressive address. This was followed by a reception and dance.

Character of the Exhibition

Four years ago, or in June, 1927, the first convention in many years without any exhibition was held in Chicago at the Edgewater Beach Hotel. Two years ago, or in April, 1929, a limited or small exhibition was held at the Stevens Hotel in Chicago as the result of a policy of large scale exhibitions only every other year. This year in the same place the exhibition was the limited one, but it was expanded to about twice the size of the one in 1929—the grand ballroom was used in addition to the regular exhibition hall in the hotel's basement.

Attendance was generally reported as satisfactory, though there was some tendency for the technical sessions to detract from the exhibit. Many exhibitors expressed themselves as satisfied with results, though there were some exceptions to this. Undoubtedly the business depression put a damper on actual sales, though inquiries and general interest were excellent. There were 167 exhibitors, with many of the familiar companies represented, such as the foundry equipment, the furnace, the sand, the pattern, the metal and alloy people, as well as many other companies.

Not much new equipment was in evidence. Among some of those noted may be mentioned a new jolt, roll-over and squeeze molding machine with no clamping or leveling devices required, the mold being rolled over during the squeeze and the pattern drawn automatically on reverse stroke of the squeeze piston. Another company offered a new alloy flask made of a magnesium-aluminum composition which is 40 per cent lighter than aluminum or wood.

A novelty in conveying equipment was shown by a conveyor company. It is designated a ball transfer. A 1½-in. diameter hardened steel ball is supported on a large number of 3/16-in. balls, which are in turn carried in a heavy hardened steel base. A group of these balls situated in the line of gravity roller conveyor systems makes it possible to transfer heavy objects easily in any direction.

Several metal companies were prominent exhibitors, including one which displayed various grades of aluminum made from scrap melted under metallurgical control in an open-hearth furnace.

Keen interest was displayed in the electric furnace exhibits, both the induction and the indirect arc. In these booths were displayed many samples of products made in such melting units, rustless steel being prominent.

Use of the talking moving picture by several companies was a feature of the whole display, and the compact size of the booths, together with the attractive surroundings, particularly in the ballroom, made for a favorable impression. There were the usual displays of the apprentice contests, A. F. A. activities, the American Society of Mechanical Engineers, the American Society for Testing Materials, and the Gray Iron Institute. There were several companies exhibiting photographs of X-ray examination in the foundry.

Undoubtedly a feature of the attendance at the exhibition in general was the quality which more than made up for the lack of large numbers. It was frequently remarked that the number of company executives present was unusually large. The operating men seemed to gravitate more to the technical sessions.

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Welcoming Meeting for Detroit Steel Plants

Steel companies which have recently opened plants in the Detroit district will be welcomed to Detroit at an iron and steel meeting of the Detroit section of the American Society of Mechanical Engineers on May 14. At a morning session at the Statler Hotel, Julius A. Clauss, chief engineer, Great Lakes Steel Corpn., will present a paper on the development of the Great Lakes plant, and Will H. Baltzell, chief engineer, Canadian Steel Corpn., will discuss the present status of the company's Ojibway plant. The afternoon will be given over to an inspection trip of the Great Lakes plant at Ecorse, Mich.

The steel companies will be officially welcomed to Detroit at a dinner meeting at the Statler Hotel in the evening. Addresses will be made by E. S. Evans, president, Detroit Chamber of Commerce; C. F. Kettering, vice-president, General Motors Corpn.; and A. C. Marshall, vice-president, Detroit Edison Co. Replies will be made by representatives of the steel companies.

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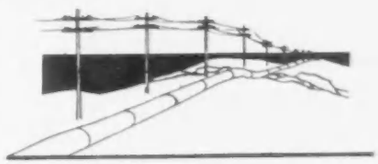
Awards $1200 in Prizes for Bridge Designs

For the most esthetic design of a steel bridge, the American Institute of Steel Construction has awarded five prizes totaling $1,200. The prize winners were selected from some 150 students of engineering and of architecture in the various colleges and universities of the United States and Canada.

The first prize of $500 for the best design by a student of architecture went to R. F. Weber of Atelier Adams Nelson, Chicago. The second prize of $250 was awarded to Glenn E. Crippen of Iowa State College, and the third prize of $100 went to Lester W. Casey of Iowa State College.



PIPE LINES

Steel for Two Small Lines on Pacific Coast Awarded

ASIDE from the award of steel for two small pipe lines on the Pacific Coast, the week has been uneventful in letting of pipe line contracts. A 20-in. line from northern Pennsylvania to Syracuse, N. Y., to cost $1,000,000, is projected. Details of the week's developments follow:

Montana Power Co., Butte, Mont., has started work on a pipe line which will carry natural gas from Montana fields to cities of southwestern Montana, including Butte and Anaconda. Project entails expenditure of about $15,000,000.

Plan of the North Central Gas Co. to lay a gas line from Wyoming to western Nebraska, mentioned a week ago in this column, apparently has been abandoned or indefinitely postponed.

Kettleman North Dome Association, Kettleman Hills, Cal., has awarded 344 tons of plates for a 12 to 16-in. welded steel pipe line to the Western Pipe & Steel Co.

San Francisco has awarded 1000 tons of plates for a pipe line for the University Mound district to the Consolidated Steel Corpn., Los Angeles.

Lycoming Natural Gas Co., Pittsburgh, recently organized subsidiary of Standard Oil Co. of New Jersey, plans construction of a 20-in. natural gas pipe line from Tioga fields in northern Pennsylvania to Syracuse, N. Y., and vicinity. Project is scheduled for completion by end of year and will cost over $1,000,000. John C. Hawkins, Pittsburgh, is head.

Belmont Quadrangle Drilling Co., Bradford, Pa., has awarded a contract to Rich & Co., Bradford, for a 10-in. pipe line from Dundee to Wayne, N. Y.

Texas Co., Houston, Tex., has inquiries out for a quantity of 8⅝-in. and 10¾-in. pipe, for pipe line from east Texas oilfields to connect with main line to coast, about 60 miles.

Atlas Pipe Line Co., Shreveport, Ark., recently organized by E. R. Rateliff, Shreveport, plans construction of a pipe line from east Texas oilfields to Shreveport and vicinity.

Panhandle Power & Light Co., Borger, Tex., has plans for a natural gas pipe line from Dumas, Moore County, Tex., to Boise City, Okla., about 74 miles.

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Pilling & Co., Inc., Philadelphia, sellers of pig iron, alloys and coke, closed their New York office on April 30.

British Engineering Unions Including 1,000,000 Workers May Strike

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(By Cable)

LONDON, ENGLAND, May 11.

THE engineering industry is facing the prospect of a strike, as the unions decline to accept employers' proposals for revision of wages and working conditions. If the employers decide to enforce their proposals, about 1,000,000 men will be affected.

Domestic consumers of Cleveland pig iron are continuing their policy of abstention from buying, expecting price reductions, and export sales are negligible. Hematite iron producers are reducing stocks, and two furnaces will resume operations soon.

Shipbuilders are complaining of the high cost of British steel, and urgently pressing for price reductions, but the Steel Association is unwilling to accede, although steel mills are generally short of orders for heavy material, as export demand is negligible.

Continental inactivity continues and steel prices are weaker. Certain German works have withdrawn outstanding offers and are awaiting more favorable prices.

German negotiations for large Soviet orders are reported to have failed because of Russian dissatisfaction with the German price conditions.

The Continental Wire Rod Cartel meets in Brussels May 15, when the price situation will be reviewed.

German, Belgian, French and Luxemburg cotton tie export prices and quotas have been renewed until the end of December.

Tin plate prices are weak, with mills seeking to keep operating by accepting 14s. 9d. ($3.58) per base box, f.o.b. works port, for plates rolled from foreign steel.

The market situation is becoming further involved by threatened withdrawals of certain mills in the South Wales Tin Plate Corporation. The Morriston works has actually withdrawn, and others are expected to leave, although negotiations are proceeding.

Negotiations between Sheffield engineers and the Soviet Union for a contract to erect an iron and steel plant in Russia have failed because of inability to agree on financial terms.

Clyde shipbuilders have for some time been perturbed over the failure in steel plates on new vessels. After a few voyages the plates often become pitted and scaled, necessitating renewals of the shell. So far no satisfactory conditions have been reached, but investigations are continuing.

Colonel Wright, chairman of the board, Baldwins, Ltd., addressing the spring meeting of the Iron and Steel Institute in London last week, said of the tin plate industry that while it is generally appreciated that the post war period has been partly transitional, it has been less generally recognized that this period has coincided with further expansion of capacity for tin plate output in America, Germany, France, India and Japan, developments representing a permanent feature, with which the Welsh tin plate industry must reckon. Future action must be planned and the whole field of production and distribution explored to enable the industry to accommodate itself to these changed conditions.

The Krupp Stahlverein-Bochum experimental plant, manufacturing sponge iron direct from the ore, has closed pending improved prices, al-

British face prospect of wage dispute involving 1,000,000.

* * *

Soviet negotiations with Germans for steel materials, and with British for contract to build steel plant fail because of financial terms.

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Italian ball and roller bearing makers increasing their export sales in Europe.

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Jugoslavia places $15,000,000 cable order in Germany, and German maker plans Jugoslavian plant.

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British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at $4.8665 (par)

British Prices, f.o.b. United Kingdom Ports

Ferromanganese, export	£9	0s.	to	£11	5s.	$43.74	to	$54.75
Billets, open-hearth	5	2½	to	5	10	24.91	to	26.76
Black sheets, Japanese specifications	10	5				49.82		
Tin plate, per base box	0	14¾	to	0	15¼	3.58	to	3.71
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.71	to	1.81
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	2½	1.66	to	1.76
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	8	10				1.84		
Galvanized sheets, No. 24 gage	11	0				2.42		

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2	8s.	to	£2	9s.	$11.66	to	$11.90
Billets, Thomas (nominal)	£3	6s.	to	£3	7s.	$16.04	to	$16.28
Wire rods, low C., No. 5 B.W.G.	5	2½	to	5	7½	24.94	to	26.15
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	3	14	to	3	15	0.80	to	0.81
Beams, Thomas, British standard (nominal)	3	10	to	3	11	0.78	to	0.79
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	3	14	to	3	15	0.80	to	0.81
Angles, Thomas, 3-in.	3	15	to	3	15½	0.81	to	0.82
Hoops and strip steel over 6-in. base	4	7	to	4	8	0.94	to	0.95
Wire, plain, No. 8 gage	4	18½				1.08		
Wire, barbed, 4-pt. No. 12 B.W.G.	8	12½				1.90		

though results are reported satisfactory.

Under a trade agreement between Italy and the Soviet, Italy will sell Russia 350,000 lire of goods with the Italian Government guaranteeing 75 per cent of the payments. The agreement provides three and a half years' credit for ship orders and 25 months' credit on other contracts, including electrotechnical equipment, chemicals, motors and airplanes.

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Italian Bearings Invade European Markets

HAMBURG, GERMANY, April 29.—A noteworthy development in European ball and roller bearing business in the past year has been the increased volume of this trade taken by Italian manufacturers, who have been able to replace the Swedish product in certain markets. Italian makers have sold some substantial orders of ball and roller bearings to German and other Continental users. It is currently reported that Swedish and Italian manufacturers are engaged in negotiations for an agreement.

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European Motor Industry Used Less Steel in 1930

HAMBURG, GERMANY, April 29.—British and Continental motor car manufacturers are estimated to have used a total of 756,000 tons of steel in 1930, compared with 816,000 tons in 1929. Of the total steel used by the industry, about 47 per cent is estimated to have been sheets and about 31 per cent alloy steels.

Soviet Reported Selling Aluminum Under Market

HAMBURG, GERMANY, April 29.—As a result of recent Russian orders, the Continental Aluminum Cartel is receiving protests from other Continental consumers of aluminum. As previously reported, a substantial contract for aluminum was taken by the cartel at about £7 a ton (1.54c. a lb.) under the schedule price. It is now reported that part of this aluminum was resold by the Soviet to various European consumers at £2 to £3 a ton (0.44c. to 0.66c. a lb.) under the market.

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German Bolt and Nut Cartel Fails

HAMBURG, GERMANY, April 29.—In view of the recent activity of European bolt and nut manufacturers in shipping their products to the United States, it is noteworthy that the German Bolt and Nut Manufacturers Cartel has failed, as it was unable to obtain as members certain producers, which have been keenly competing with the cartel members.

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Japan Consuming More Sheet Piling

YOKOHAMA, JAPAN, April 8.—With the Seitetsu Jo (Government Steel Works) producing 1200 to 1300 tons of sheet steel piling a month, which is the program for the rest of this year, competition with the imported product is expected to bring reductions in price, followed by increased use of steel piling. The demand for piling has been increasing steadily, advancing from 18,022 metric tons in 1927 to 23,767 tons in 1928, 28,551 tons in 1929 and 28,849 tons in 1930. The current quotation on steel piling is about 150 yen ($73.95) a ton.

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Polish Rail Mills Undersell Cartel

HAMBURG, GERMANY, April 29.—Polish rail mills, which are not members of the International Rail Makers' Association, have recently sold rails to Chile, Peru and Jamaica at about 5s. ($1.22) a ton under the price fixed by the rail cartel. This is not expected to continue as the Soviet Union has just placed a substantial rail order in Poland, which, it is believed, will engage the Polish mills for some months.

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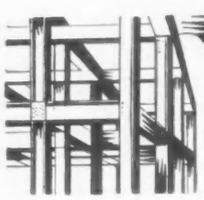
German Company Sells 85 Per Cent for Export

HAMBURG, GERMANY, April 29.—Demag A. G., Duisburg, one of the largest German manufacturers of cranes, dredgers and rolling mill equipment, states that its business turnover in 1930 was 5 per cent smaller than in the previous year. Demag is now disposing of 85 per cent of its manufactures in export markets and only 15 per cent in Germany. In the past year the company has established three subsidiaries to build and sell special machinery.

UNUSUAL MOTOR TRUCK BUILT IN ENGLAND

A motor truck capable of carrying loads of 100 tons has recently been completed in England. It is said to be the largest mechanically-propelled road vehicle in the world. Few, if any, trucks of this capacity have been built in this country, according to companies engaged in the transportation of heavy materials and machinery. The English truck has 14 wheels, 12 of which are mounted in pairs on relatively short axles, with the load always evenly distributed between individual axles. The builders were faced with the problem that the truck might be helpless if it sank into a soft place in the road, and an ingenious provision has been made for lifting the driving wheels of the motive unit clear from the ground, so that steel plates can be placed under them.



PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Business Is Less Active

Sales and Inquiries This Month Show a Further Decline

MACHINE tool business in all of the leading centers of the country has lapsed into a condition of extreme dullness. Not only have sales declined, but inquiries are fewer, and a good deal of the business that was in prospect has been postponed until more definite signs appear of a business recovery.

Orders for shop equipment were in an uptrend during January, February and March, but declined in April, and indications are that there will be a further drop this month. There is general acceptance of the view that no uptrend in orders is likely to be experienced before fall at the earliest.

While inquiries and sales are confined mostly to single tools, a few prospects of larger size have appeared. A list for the Austin High School, Chicago, calls for 24 lathes, a shaper, a milling machine and a planer. The War Department is in the market for five universal milling machines for Wright Field, Dayton, Ohio.

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NEW YORK

May business in machine tools in the New York district has been about the dullest since the gradual upturn began early in the year, culminating in what appears now to have been a peak in March. April business was below that of March, and it seems certain that the May totals will decline from those of April. The dullness is confined to both sales and inquiries. The conclusion of the trade is that many prospective buyers of tools, having lost hope of any important revival in general business before the fall at the earliest, have indefinitely postponed action on purchases that were under consideration.

CHICAGO

The local machine tool market is enlivened by the list for the Austin High School, on which bids were opened May 12. The list includes 24 13-in. x 5-ft. lathes, a 16-in. shaper, a No. 2 milling machine and a 42-in. open-side planer, all motor-driven. The Santa Fe continues to move slowly in placing orders against its list and word is lacking as to when the Milwaukee Road will enter orders. On the whole, May so far is bringing nothing more to machine tool dealers than April.

MILWAUKEE

The volume of machine tool business has dwindled further and inquiry is less active. Only the most urgent needs are being covered, judging by the character of buying. Automotive industries are doing little, but there is a ray of hope in the improvement in retail passenger car sales. Action is expected soon at Chicago on the list for the Milwaukee Road's shops in Milwaukee.

PITTSBURGH

Business so far this month has shown little change from April, which fell considerably under March in aggregate orders. Inquiry has also fallen off and some business which seemed to be approaching the closing stage has been postponed indefinitely. The Westinghouse Electric & Mfg. Co., East Pittsburgh, has decided to put off buying the tools, for which it inquired recently, until its needs become more pressing.

Railroad orders are still lacking, but most dealers now expect little business from this source until trade recovery becomes an actuality. Fabricating shops have taken few tools this year, and barge yards in the district which have received considerable business recently seem to be well equipped.

CLEVELAND

While a little more interest is being taken in the purchase of machine tool equipment by manufacturers in several northern Ohio cities outside of Cleveland, orders are still very light and there is not much active inquiry. Sales are holding up to about April volume. An inquiry for five universal milling machines has been put out by the War Department, Air Corps Material Division, Wright Field, Dayton, Ohio, for various airports. Bids will be taken May 27.

NEW ENGLAND

Dealers in both new and used tools report business at a standstill. Some increase in activity is noted in plants near the Atlantic Coast, but New England manufacturers in general are less active than at any time in the past 17 months.

Small tool sales are holding up fairly well, but individual purchases are small.

CINCINNATI

Current orders are small in number. Inquiry has slackened noticeably and requests for quotations previously received have, to a large extent, become inactive. Production is at a low rate, with some plants near the closing point.

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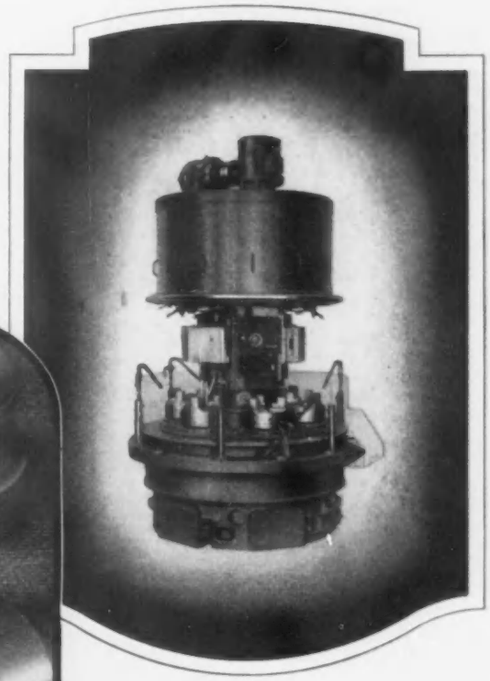
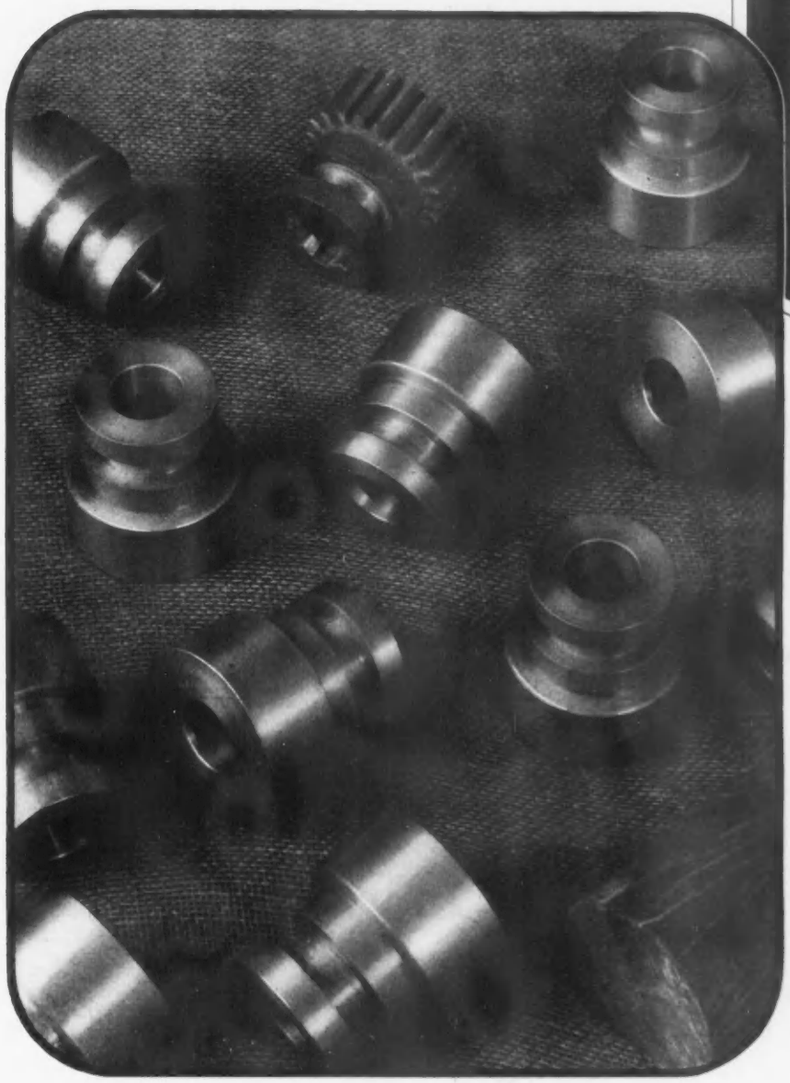
New York

PLANS are under way by Sylvania Industrial Corpn., 122 East Forty-second Street, New York, manufacturer of transparent cellulose paper products, for addition to mill at Fredericksburg, Va., to cost over $500,000 with machinery. H. H. Replogle is vice-president in charge.

New York Power & Light Corpn., Albany, N. Y., plans erection of compressor plant for high-pressure gas line service at Schenectady, N. Y., with initial capacity of 125,000 cu. ft. an hr. Company has purchased property near South Glens Falls

BULLARD





BULLARDS MAY BE PURCHASED ON DEFERRED PAYMENT PLANS

The Mult-Au-Matic makes intensive use of productive time by performing multiple operations at effective feeds and speeds for each cut, yet simultaneously multiplied to include all cuts on the piece.

Thus, "The Method" provides maximum earning capacity at substantially lower production cost.

Details submitted upon request.

The Bullard Co.

Bridgeport, Conn.

for another compressor plant, also gas storage and distributing unit. Entire project will cost over $450,000. Company engineering department is in charge.

Superintendent of Lighthouses, Third District, Staten Island, N. Y., will receive bids until May 21 for 200 acetylene cylinders, 88-cu. ft. capacity, for shipping acetylene gas under pressure.

Thornton A. Converse, 2526 Lavin Court, Troy, N. Y., and Merton G. Bickford, 116 High Rock Avenue, Saratoga Springs, N. Y., have organized Converse-Bickford Electric Co. to operate a shop at Troy for manufacture of electrical equipment.

Marine Mfg. & Supply Co., 158 South Street, New York, manufacturer of marine equipment and supplies, has leased four-story and basement building at 228-30 Greenwich Street for new plant.

Department of Sanitation, Municipal Building, New York, has plans for group of 33 sewage disposal plants in different points of harbor districts for purification of harbor waters, including power and pumping machinery, conveying and other handling equipment, to cost $158,775,000.

Freed Television & Radio Corpn., New York, has been organized by Arthur Freed, 12 East Eighty-sixth Street, Joseph D. R. Freed, 912 Fifth Avenue, and associates, and plans operation of local factory for manufacture of radio and television equipment and parts.

Southern Alkali Corpn., care of American Cyanamid Co., 535 Fifth Avenue, New York, recently formed by officials of latter company and Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, as joint subsidiary, has purchased 350 acres near Corpus Christi, Tex., for new plant for production of alkali products and commercial chemicals. Works will include power house, machine shop and other structures, and will cost over $5,000,000 with machinery. A ship channel will be constructed and harbor built at plant for ocean-going vessels.

Viscosity Engineering Corpn., New York, has leased space in building at 250 West Fifty-fourth Street, for manufacture of gages and kindred engineering specialties.

Port of New York Authority, 80-90 Eighth Avenue, New York, will receive bids until May 25 for electrical equipment for George Washington Bridge over Hudson River, between Fort Washington, N. Y., and Fort Lee, N. J.

Lakewood Studio & Mercantile Land Co., Lakewood, N. J., care of Daniel J. Scrocco, 60 Park Place, Newark, architect, expects to complete plans this month for new radio broadcasting station and motion picture studio, with power house, shop and other mechanical units on 4000-acre tract in Pine Forest Manor, Lakewood, to cost close to $1,000,000 with equipment.

New Jersey Power & Light Co., Dover, N. J., is disposing of a bond issue of $6,000,000, part of proceeds to be used for general expansion and improvements. Company is affiliated with Associated Gas & Electric System, 61 Broadway, New York.

Board of Education, Jamesburg, N. J., is considering installation of manual training equipment in new high school to cost over $175,000, for which bids are being asked on general contract until May 18. John N. Pierson & Son, 198 Jefferson Street, Perth Amboy, N. J., are architects.

Unique Art Mfg. Co., 196 Waverly Avenue, Newark, manufacturer of mechanical toys, parts, etc., contemplates call for bids on general contract early in June for two-story addition, to cost about $100,000 with equipment. Saul Shaw & Co., 24 Commerce Street, are architects and engineers.

Lever Brothers Co., 164 Broadway, Cambridge, Mass., manufacturer of soaps, washing powders, etc., has leased plant of American Can Co. at Edgewater, N. J., and will remodel for new plant at cost of more than $500,000.

Signal Supply Officer, Army Base, Brooklyn, will receive bids until May 29 for mast plates, mast caps, mast sections and releases, etc.; until June 3 for seven projector equipments, drying racks, etc.

George Scherr Co., New York, gear cutting machinery and measuring tools, has removed its offices from 142 Liberty Street, to larger quarters at 128 Lafayette Street.

On May 1 manufacturing business of Lambert Hoisting Engine Co., Newark, N. J., was acquired by McKiernan-Terry Corpn., 15 Park Row, New York. To preserve identity of Lambert name, it will be known as Lambert Hoisting Engine Division of McKiernan-Terry Corpn., in charge of John A. Lambert. Lambert hoisting engines, derricks, cableways, coal-handling machinery and other products will hereafter be manufactured in works of McKiernan-Terry Corpn., Harrison, N. J., where in past year extensions have been made and additional machinery installed.

Central Hudson Gas & Electric Corpn., Poughkeepsie, N. Y., has contracted with Propane-Butane Contracting Corpn., Baltimore, for consulting engineering service covering a Butane air-gas dilution plant to be installed at Catskill, N. Y. Kemp air-gas carburetion equipment will be used.

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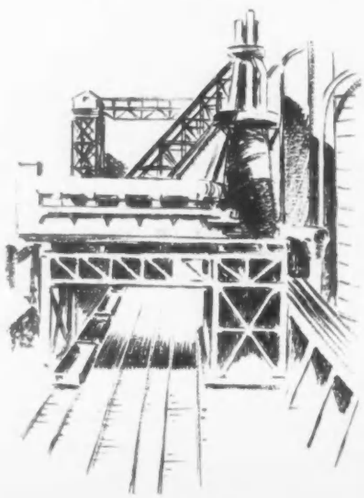
New England

BIDS have been asked on general contract by Jenkins Brothers, Inc., Water Street, Bridgeport, Conn., manufacturer of valves and kindred engineering products, for one-story addition to cost over $35,000 with equipment. Headquarters are at 80 White Street, New York. Lockwood Greene Engineers, Inc., 100 East Forty-second Street, New York, is architect and engineer.

Boston Port Development Co., 1 Court Street, Boston, is planning new oil storage and distributing plant at Revere, Mass., with initial capacity of 2,745,000 bbl. in steel tanks, pumping and auxiliary equipment, to cost over $250,000 with equipment.



Charles M. Parker, 362 Border Street, East Boston, and associates have organized Marine Engine Repair, Inc., to operate a local engine repair and parts plant. Mr. Parker will be president and treasurer.

State Department of Education, Commonwealth of Massachusetts, Boston, has plans for two-story practical arts building at State Normal School, Fitchburg, Mass., to cost about $160,000. Haynes & Mason, 280 Main Street, Fitchburg, are architects.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids until May 25 for a gasoline-operated locomotive crane for navy yard at Boston.

Board of Trustees, Connecticut School for Boys, Meriden, has awarded general contract to Merritt, Chapman & Scott Co., New London, Conn., and Providence, R. I., for new group of buildings, including an industrial school unit, at price of $538,000. List of equipment will soon be arranged. Walter T. Arnold, Meriden, is architect.

Stacklin Corpn., Providence, R. I., recently organized, will take over metal container division of Simplex Tool Co., Woonsocket, R. I., for production of such specialties.

A. B. Franklin, Inc., 25 Haverhill Street, Boston, engineer, will soon take bids for a coal trestle at State hospital, Gardner, Mass., to cost $10,000.

City of Waterbury, Conn., has plans for a one-story booster pumping station, to cost $50,000 with equipment. Pumping equipment, motors, etc., will be purchased.

Jenkins Brothers, South Main Street, Bridgeport, Conn., has closed bids on a machine shop addition to provide space for an electric traveling crane and radial drill equipment. Lockwood Greene Engineers, Inc., New York, is architect.

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Buffalo

PLANS have been filed by Board of Trustees, University of Buffalo, Niagara Square, Buffalo, for steam power plant, 50 x 100 ft., and 65 ft. high, for central heating service, to cost about $400,000 with machinery. Edward B. Green & Son—Albert Hart Hopkins, 1 Niagara Square, are architects. John W. Danforth Co., 70 Ellicott Square, is consulting engineer.

William R. Pierce, head of Pierce Tool Works, 433 Avenue A, Rochester, N. Y., and associates have organized Pierce Specialty Corpn., as an affiliated interest, to manufacture metal products. Howard J. Peo, 38 Avenue D, is interested in new organization.

Delaware, Lackawanna & Western Railroad, 90 West Street, New York, is considering expansion program at Buffalo yards, including a new car-retarding switch yard, shops and other structures to cost close to $2,000,000 with equipment.

Curtiss Aeroplane & Motor Co., Vulcan Street and Kenmore Avenue, Buffalo, is developing maximum production schedule in both parts and assembling departments. Company has received additional Government orders for 40 army planes, totaling $550,000, and making a gross of $1,580,000 for Government account, including previous order for navy aircraft.

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Philadelphia

BUILDING at 2207 Chestnut Street, Philadelphia, has been leased by Stutz Philadelphia, Inc., 2200 Diamond Street, representative for Stutz automobiles, for new service, repair and sales building.

Board of Education, Paulsboro, N. J., is considering installation of manual training equipment in new two-story high school to cost about $150,000, for which bids have been asked on general contract.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, is asking bids until Mary 18 for 20 fuel quantity gages.

Booth Bottling Co., Clearfield and Ruth Streets, Philadelphia, has leased two-story and basement factory at 1822-24 East Clearfield Street, totaling 4000 sq. ft. space, for extensions in storage and distributing department.

International Resistance Co., 2006 Chestnut Street, Philadelphia, manufacturer of radio resistors and kindred radio apparatus, has leased factory space at Toronto for new branch plant, to be operated in name of International Resistance Co., Ltd., a Canadian subsidiary.

Department of Public Works, Bureau of Highways, City Hall Annex, Philadelphia, is asking bids until May 19 for electrical supplies. Alexander Murdoch is director.

Airway Express Corpn. of America, Inc., recently organized, has taken over 10-acre tract on Trenton-Bordentown Highway, near Bordentown, N. J., for establishment of headquarters and flying field. Plans are under way for several hangars and one-story machine shop and reconditioning works, to cost over $50,000. Company will also establish an assembling plant later.

C. V. Hill & Co., 360 Pennington Avenue, Trenton, N. J., manufacturer of refrigerators, has awarded general contract to William Burton & Son, 25 Weinder Avenue, for one-story addition, to cost about $50,000 with equipment.

Keystone Aircraft Corpn., Bristol, Pa., has secured contract from War Department for 64 bombardment planes, with spare parts, contract totaling $1,926,510.32, and will develop maximum capacity at plant for at least a year, giving employment to about 1600 persons.

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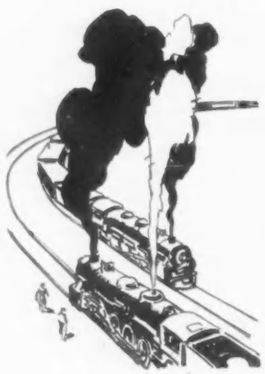
Cleveland

BIDS have been asked on general contract by Strong, Carlisle & Hammond Co., 1394 West Third Street, Cleveland, manufacturer of steam specialties, drilling machines, etc., for new two-story plant unit, 120 x 150 ft., to cost over $85,000 with equipment. H. M. Morse & Co., 750 Prospect Street, are architects and engineers.

India Tire & Rubber Co., Akron, Ohio, will carry out expansion and improvements, including installation of equipment. Work will be placed under way at once.

Bender Battery & Ignition Co., Cleveland, care of F. C. Friend, Society for Savings Building, recently formed, plans operation of local battery and electrical repair works. Elmer W. Waite and A. V. Miller are principal incorporators.

Cleveland Co-Operative Stove Co., 2323 East Sixty-seventh Street, Cleveland,



manufacturer of stoves, ranges, etc., has awarded general contract to John Gill & Sons, Bulkley Building, for extensions and improvements in plant unit, to cost close to $30,000.

Acme Steel Blanking Co., Toledo, Ohio, recently organized, will be affiliated with Buckeye Steel Products Co., with local plant at 397 Phillips Avenue, and will occupy part of works for initial operations. Charles Fruchtman, president, and Carl Cohn, vice-president of Buckeye company, will have same offices with new interest.

Lempco Products Co., Bedford, Ohio, manufacturer of axles and other automobile equipment and parts, is considering a one-story addition to cost over $100,000 with machinery.

E. H. Karcher Forging Co., East Fifth Street, East Liverpool, Ohio, has resumed production at its plant, following a shutdown of almost one year.

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Chicago

PLANS have been filed by People's Gas Light & Coke Co., 122 South Michigan Avenue, Chicago, for two-story compressor plant, 74 x 148 ft., to cost about $100,000 with machinery. R. Schenck, address noted, is company architect.

Board of Education, Worthington, Minn., is considering installation of manual training equipment in new two-story and basement high and grade school to cost about $200,000, for which plans will be drawn by Jacobson & Jacobson, Wesley Temple Building, Minneapolis, Minn., architects.

Banner Bed Corpn., Chicago, recently organized, has leased floor at 400-8 North Oakley Boulevard for manufacture of metal bedsteads.

Otter Tail Power Co., Fergus Falls, Minn., is arranging construction and betterment program to cost $1,000,000, including extensions and improvements in electric light and power plants at Wahpeton and Hankinson, N. D., and Boyd, Minn., first noted to cost about $200,000 with equipment, and for extensions in transmission lines in Minnesota and North Dakota.

Super Oil Co., Eleventh Street and Central Avenue, Moorhead, Minn., is considering one-story addition to bulk oil storage and distributing plant, 46 x 100 ft., to cost close to $30,000 with equipment.

Iowa Public Service Co., Sioux City, Iowa, is considering extensions and improvements in steam-operated electric generating plant at North Riverside, in connection with an expansion program to cost close to $1,300,000, including new turbine building and installation of additional equipment.

Quartermaster, United States Army, Chicago, is asking bids until May 19 for one draft gage, feed-water heater, condensation pump and receiver, and other mechanical equipment.

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South Atlantic

WORK will soon begin by Pennsylvania Railroad Co., Philadelphia, on construction and improvement program in Baltimore district, for which a fund of $22,000,000 has been allotted, including electrification of local lines, new warehouse and distributing buildings, reconstruction of Calvert Station and other work. Company engineering department will be in charge.

Ort Brothers, Lonaconing, Md., plan installation of ovens, power equipment, conveying and other machinery in new one and two-story baking plant at Midland, 105 x 175 ft., to cost over $65,000. Braziell & Anderson, 309 Fourth Avenue, Pittsburgh, are architects and engineers.

Eastern Shore Public Service Co., Salisbury, Md., is disposing of a bond issue of $1,250,000, part of fund to be used for extensions and improvements in plants and system. A. W. Higgins is president.

Board of District Commissioners, District Building, Washington, will receive bids until May 25 for a portable gasoline-driven air compressor; until May 27 for truck bodies for use at penal institute.

Powhatan County School Board, Powhatan, Va., has authorized installation of a manual training shop in new two-story and basement high school to cost over $100,000, for which general contract has been let to Farmville Co., Farmville, Va. Fred A. Bishop, Electric Building, Richmond, Va., is architect.

Bureau of Standards, Washington, has awarded general contract to Sofflet & Tillotson Co., Wesley Building, Philadelphia, for new hydraulic laboratory, to cost $350,000 with equipment.

Bids will be received until May 20 by Bureau of Yards and Docks, Navy Department, Washington, for one 90,000-gal. steel gasoline tank for naval operating base, fuel depot, Hampton Roads, Va.

Board of Public Improvement, City Hall, Baltimore, plans installation of manual training equipment in new three-story junior high school in Forest Park district, for which low bid on general contract has been received from H. L. Maas & Sons, 1119 North Ensor Street. Smith & May, Baltimore Trust Building, are architects. H. J. Leimbach is supervising engineer for board.

Simplex Pattern Control Co., Charlotte, N. C., recently organized by local interests to manufacture a pattern control for weaving machines and kindred equipment, has established temporary headquarters at 24 South Tryon Street. Company will carry out initial production at plant of Barkley Machine Works, Gastonia, N. C., and a considerable part of that plant will be given over to new equipment. An affiliated interest has been organized under name of Simplex Machine Co., with headquarters for sales and distribution. Ellis W. Henderson, J. N. McKelvy and J. L. Reynolds, all of Charlotte, head new organizations.

General Purchasing Officer, Panama Canal, Washington, is asking bids until

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Division of Purchases and Sales, Department of Commerce, Washington, will receive bids until May 21 for radio steel antenna towers.

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Milwaukee

PLANS are under way by Albert L. Fiegel & Co., architects, 207 Baker Block, Racine, Wis., for remodeling structure, 100 x 102 ft., for Lockwood-Thompson Oil Co., Racine, into garage, warehouse, service shop, etc. Investment will be about $45,000.

United States Hoffman Machinery Co., New York, manufacturer of laundry equipment, has acquired business of Vorclone Corpn., Milwaukee, manufacturer of similar machinery and equipment. Milwaukee plant will be continued as division.

To protect creditors' interests and maintain it as a going concern, I. B. Rowell Co., Waukesha, Wis., manufacturer of hammer mills, burr mills and other agricultural machinery, has been placed in charge of Oscar E. Schwemer, Brumder Building, Milwaukee, as trustee. Bondholders have consented to an extension of maturity on an issue of $120,000, on which $61,000 remains unpaid.

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Pittsburgh

PLANS have been filed by Erie Resistor Corpn., Erie, Pa., manufacturer of metal specialties for radio service and kindred equipment, for one-story addition, to cost about $30,000 with machinery.

United States Engineer Office, Pittsburgh, will receive bids until June 5 for furnishing and delivering two upper and two lower lock gates of two leaves each for new Lock No. 4, Monongahela River; until June 1 for one steel boat house.

Pennsylvania Railroad Co., Pennsylvania Terminal, Pittsburgh, is arranging for purchase of equipment for new river-rail terminal on Ohio River at Baden, Pa., including unloading machinery, conveying and other handling equipment. Entire project will cost about $350,000.

F. Tinker & Sons Co., 5665 Butler Street, Pittsburgh, manufacturer of cutlery, will soon begin erection of new one-story plant, to cost about $45,000 with equipment. Ralph M. Reutti, 5941 Baum Boulevard, is architect.

LaFrance-DeWolfe Products Corpn., Bradford, Pa., care of M. L. Jordan, Bradford, treasurer, recently formed by Mr. Jordan and associates with capital of $20,000, plans operation of local factory for manufacture of mechanical equipment, including automotive parts, vacuum power units, etc. G. R. Schnure, Bradford, is one of incorporators.

Board of Public Education, Bellefield Avenue and Forbes Street, Pittsburgh, is asking bids until May 21 for steel shelving, storeroom, truck, electric refrigeration equipment, etc. H. W. Cramblet is secretary.

H. H. Phillips, Butler, Pa., and associates have tendered an offer of $218,000 for property of Butler County Oil Refining Co., Butler, including plant, pipe lines, etc., and district court has been asked by receivers, R. H. McClester and Joseph A. Beck, to approve sale. Purchasing interests plan to operate property and carry out improvements.

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St. Louis

ERECTION of a machine shop for motor car and other equipment repairs is contemplated by Joplin Stockyards Co., 116 West Fifth Street, Joplin, Mo., in connection with new plant on 80-acre tract near Turkey Creek, recently acquired. Several storage and distributing units also will be built. Entire project will cost close to $100,000. L. P. Buchanan is president.

Ozark Casket Co., Pierce City, Mo., care of George F. Reed, Woodruff Building, Springfield, Mo., architect, has plans for new factory, consisting of one-story and basement unit, 50 x 100 ft., with wing extension, 25 x 80 ft., to cost about $25,000.

Cargill Grain Co., Omaha, Neb., has plans for an addition to grain elevator, to cost over $500,000 with elevating, screening and other equipment.

Nebraska Light & Power Co., McCook, Neb., has approved plans for extensions and improvements in steam-operated electric power plant, to include installation of traveling crane and other equipment, to cost about $45,000.

Shawnee Milling Co., Shawnee, Okla., has plans for an addition to grain elevator, to cost over $85,000 with equipment. Jones-Hettelsater Construction Co., Mutual Building, Kansas City, Mo., is engineer and contractor.

J. I. Case Co., Racine, Wis., manufacturer of agricultural machinery and implements, has plans for a one-story addition to branch plant at Oklahoma City, 50 x 200 ft., to cost close to $75,000 with equipment.

City Council, Fredonia, Kan., is considering plans for extensions and improvements in municipal electric light and power plant, to cost over $40,000 with equipment. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

Yaffee Iron & Metal Co., South A Street, Fort Smith, Ark., has arranged for increase in capital from $100,000 to $130,000 for general expansion.

Cincinnati

PLANS are under way by Frank Kummer & Sons, 1212 Queen City Avenue, Cincinnati, manufacturer of steel forgings and other equipment, for one-story addition, 30 x 100 ft., for storage and shop service, to cost about $25,000 with equipment.

Board of Trustees, University of Cincinnati, Cincinnati, has plans for a new mechanical shop and warehouse unit, to cost about $150,000 with equipment; also for a basic science laboratory to cost close to $300,000 with equipment and appliances. Work will be carried out in connection with general expansion program.

Columbus Independent Ice Co., 85 East Gay Street, Columbus, Ohio, has asked bids on general contract for a new one-story artificial ice-manufacturing plant, to cost about $65,000 with machinery. O. F. Kaiser, 31 West Mound Street, is in charge.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until May 19 for three motor-driven shaping planers, 15 gun mount assemblies and 15 sets of fittings for installation of flexible gun mount, 80 9-ft. propeller blades; until May 18 for one optical precision, length-measuring machine; until May 20 for 1 to 28 25,000-gal. capacity gasoline storage tanks, six viscosimeters, eight gasoline distillation equipments, one rotary shear, 30 tinners' groovers, 30 setting-down machines, one wiring machine, one turning machine, and 113 tinners' stakes.

Board of Education, Delaware, Ohio, plans installation of manual training equipment in new two and three-story high school to cost about $325,000, for which general contract has been let to Van Gundy-Beck Co., Lancaster, Ohio. Thomas D. McLaughlin, Lima, Ohio, is architect.

United States Engineer Office, Chattanooga, Tenn., is asking bids (no closing date stated) for four portable air compressors.

State Highway Commission, Frankfort, Ky., is considering new two-story automobile service, repair and garage building for State cars and motor trucks, to cost about $85,000 with equipment. Benjamin Johnson is chairman of commission.

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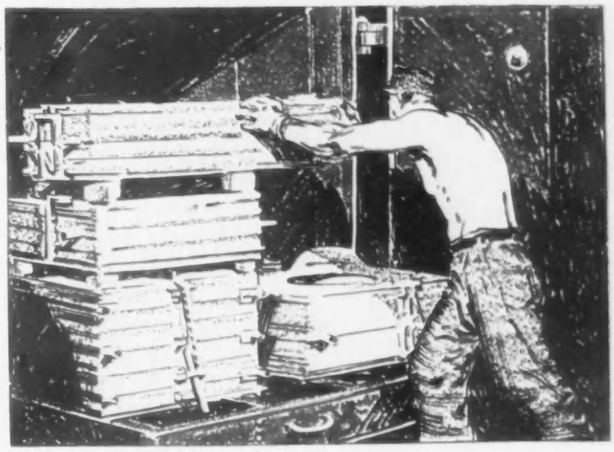
Indiana

PROPERTY at Anderson has been acquired by Bickett Rubber Products Corpn., Watertown, Wis., which will remodel for a new plant. Works at Watertown will be removed to new location and capacity increased.

Ryker Gasefier Co., Indianapolis, care of Al Pfeiffer, 5120 East Walnut Street, recently organized by Mr. Pfeiffer and associates, plans operation of local factory for manufacture of carburetors and kindred equipment. Harry Ryker, Indianapolis, will head new organization.

Board of School Commissioners, Knightstown, plans installation of manual training equipment in new two-story and basement high school to cost about $160,000, for which bids are being asked on general contract. McGuire & Shook, Knights of Pythias Building, Indianapolis, are architects.

Miami Coal Co., Shepardsville, is considering rebuilding tipple at its No. 3 mine, recently destroyed by fire, with loss close to $85,000 including machinery.



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INDUSTRIAL OVENS

Shaffer-Wiley Toy Corpn., Marion, recently formed by Alfred Shaffer and R. Wiley, both of Marion, is considering operation of factory for manufacture of toys and kindred products. Julian T. Lett, Marion, is interested in new company.

Board of Education, LaPorte, contemplates installation of manual training equipment in new two-story and basement addition to high school, to cost about $125,000, for which bids are being asked on general contract. George W. Allen, LaPorte Savings Bank Building, is architect.

Stockholders of Advance Rumely Co., La Porte, will hold a meeting May 29 to vote on a tentative contract with Allis-Chalmers Mfg. Co. whereby latter will acquire most of assets and good will of Advance Rumely in exchange for stock not to exceed 114,500 shares. Terms of contract provide that Advance Rumely will retain its Battle Creek, Mich., plant, which has a book value of $742,000. Under agreement, Allis-Chalmers is to assume all liabilities of Advance Rumely unit in amount of about $3,000,000, with exception of three court claims pending.

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Gulf States

PLANS are under way by Houston Oil Co., Houston, Tex., for an addition to refinery at Viola, Tex., with installation of equipment, to cost over $700,000.

Construction Quartermaster, Shreveport, La., is asking bids until May 28 for industrial buildings at Barksdale aircraft field, including radio and parachute shops, utilities building, paint and oil shop, and other structures.

E. W. Moutray, Abilene, Tex., operating independent oil properties, will proceed with erection of new refinery at Hawley, to cost about $85,000 with machinery. A short pipe line will be built for oil supply.

Harold English, 1211 Lincoln Street, Amarillo, Tex., has plans for a one-story machine shop, 59 x 140 ft., to cost about $24,000 with equipment. Berry & Hatch, Oliver Eakle Building, are architects.

Texas & Pacific Railway Co., Dallas, Tex., has awarded general contract to P. B. Montgomery, Industrial Building, for a two-story storage and distributing warehouse, 80 x 219 ft., to cost about $165,000 with conveying and other equipment. E. F. Mitchell, Dallas, is chief engineer.

Wheeling-Lordsburg Copper Co., Lordsburg, N. M., recently organized with capital of $1,000,000, will take over and operate local plant and properties of Anita Copper Co. New organization contemplates expansion and improvements later.

Board of Trustees, Tuskegee Institute, Tuskegee Institute, Ala., has authorized plans for a new multi-story engineering building, to be known as Thomas A. Edison engineering building, to cost $300,000 with equipment. Appropriation has been secured.

Southwest Neon Sign Co., Houston, Tex., manufacturer of electric tube lighting displays, has leased space in building of Hart Enterprise Electric Co., Inc., 826 Baronne Street, New Orleans, for branch plant. Initial operations will be given over to tubing, parts, etc., with addition of other facilities later for complete sign manufacture.

J. F. Stillwell, Brownwood, Tex., and associates have taken over a local oil refinery, built a few years ago but never placed in service, and will remodel at cost of about $40,000 with equipment.

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Detroit

PLANS are under way by Gulf Refining Co., Frick Annex, Pittsburgh, for new bulk oil storage and distributing plant at River Rouge, Detroit, to cost over $100,000 with equipment, including service and garage unit for company motor trucks and cars. F. A. Robinson, 2248 West Warren Street, Detroit, is local manager.

Graham-Paige Motors Corpn., 8505 West Warren Street, Detroit, has purchased a three-story factory at Walkerville, Ont., totaling about 60,000 sq. ft., and will remodel for new branch assembling plant for Canadian trade, to cost over $150,000. Arthur Kreuger will be managing director at new plant.

Common Council, Hartford, Mich., has plans for a new municipal electric light and power plant, to cost about $50,000 with machinery. City engineer is in charge.

Grand Rapids Radio Mfg. Co., 965 Lake Drive, Grand Rapids, Mich., recently organized with capital of $50,000, plans operation of local factory for manufacture of radio equipment and parts. Howard A. Shead, 608 Laurel Street, S. E. and Raymond P. Jones, Grand Rapids, head company.

Gogebic & Portage Lake Boat & Engine Co., Houghton, Mich., A. B. Hargrave, head, is planning new boat and engine repair works on Portage Lake, consisting of two one-story shops, 80 x 100 ft. and 30 x 60 ft., respectively, with electric-operated hoist and trolley, and other mechanical-handling facilities. A drydock and marine railway for larger vessels will be built later.

Board of Trustees, Michigan School for Deaf, Flint, Mich., has plans for a new three-story shop building, to cost close to $80,000 with equipment. MacKenzie & Pratt, Flint, are architects.

Ottawa County Board of Supervisors, Court House, Grand Haven, Mich., has authorized plans for a new power plant for central lighting and heating at Grand Haven County buildings, to cost over $85,000 with equipment. Byron Parks & Son, Grand Rapids, Mich., are engineers.

American Broach & Machine Co., Ann Arbor, Mich., has awarded contract to Austin Co. for a one-story addition, 40 x 92 ft., to cost $25,000. A 5-ton traveling crane will be installed.

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Canada

CITY councils of North Bay, Hamilton and Peterboro, Ont., have plans for purchase of tools and equipment for technical schools.

Schlegel Co. of Canada, subsidiary of Schlegel Mfg. Co., Rochester, N. Y., manufacturer of automobile body trimmings, has leased manufacturing space in building at 163 Dufferin Street, Toronto, to take care of its Canadian business. George Odell will be manager.

Henry Motor Co., Fairport, Ill., manufacturer of hearses, etc., has arranged with A. B. Greer & Sons, Ltd., London, Ont., to manufacture its products for Canadian trade. Latter company will install some new equipment.

City Council, Sudbury, Ont., is inquiring for following equipment for a technical school: One Parker milling machine, seven MacDougall lathes, one Brown & Sharpe grinder, one Ford-Smith pedestal grinder, one South Bend lathe, one Butler shaper, one 20-in. Canadian Blower & Forge Co. drill, one Canedy-Otto sensitive drill, one Williams power hack saw, one Williams arbor press and one Dunmore grinder.

Frontenac Floor & Wall Tile Co., Kingston, Ont., has plans for an addition to cost $75,000 to $100,000.

Hump Hairpin Co., Prairie and Twentieth Streets, Chicago, has awarded contract to Dakin Construction Co., Ltd., 270 Beamont Street, Montreal, for a one-story plant on St. Anne Street, Montreal, to cost $90,000.

Bids will be received until June 4 by secretary of Board of Control, Transportation Building, Ottawa, Ont., for furnishing and installing equipment and appurtenances for water purification plant on Lemieux Island, Diesel engines, etc.

Hayden Gold Mines, Ltd., 611 Federal Building, Toronto, is contemplating installation of a 100-ton mill at its mine in Ogden Township, Ont.

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Pacific Coast

CONTRACT has been let by Paraffine Companies, Inc., 475 Brannon Street, San Francisco, to MacDonald & Kahn, Financial Center Building, for one-story addition to plant at Emeryville, Cal., to cost about $55,000 with equipment. Leland Rosener, 233 Sansome Street, San Francisco, is engineer.

Consolidated Foundries, Inc., Oakland, Cal., recently organized to take over Pacific Malleable Castings Co., Oakland; Steel & Malleable Co., San Francisco, and other interests, including Western Malleable Castings Co., Los Angeles, has arranged for a change of company name to General Metals Corpn., and will remove headquarters from Oakland to San Francisco.

Midland Counties Power Co., Fresno, Cal., is planning a steel tower transmission line from Los Alamos to Buellton, Cal., where a power substation will be built, to cost over $100,000 with equipment.

Canoga Citrus Association, Owensmouth, Cal., plans installation of conveying machinery and other handling equipment in new one-story packing plant, for which general contract has been let to Arthur S. Barnes, Title Insurance Building, Los Angeles, to cost close to $35,000 with equipment. Arthur C. Munson, Title Insurance Building, is architect.

Vallejo Junior High School District, Vallejo, Cal., plans one-story vocational shop in connection with new junior high school group to cost about $235,000, for which plans will be drawn by Davis-Pearce Co., Stockton, Cal., architects.

Braun Corpn., 363 New High Street, Los Angeles, manufacturer of scientific instruments and apparatus, laboratory equipment, etc., has asked bids on general contract for a two-story storage and distributing plant, 85 x 400 ft., to cost about $100,000 with equipment. Walker

SCHATZ

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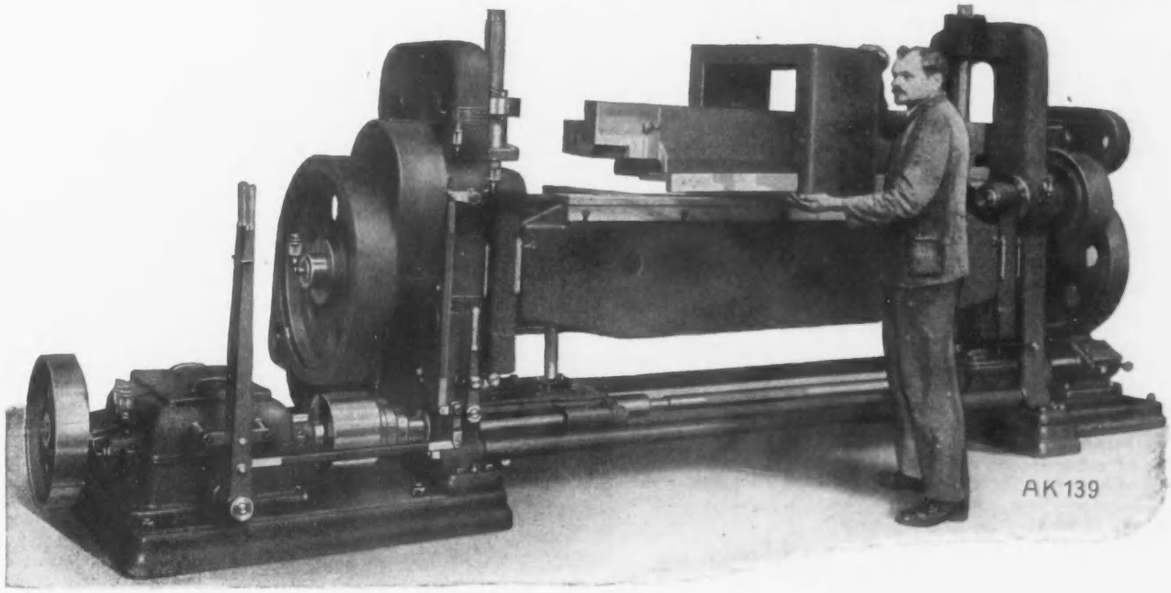

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Business as Others See It

Digest of Current Financial and Economic Opinion

GENERAL opinion is that business still is following a sidewise movement, fluctuations being without significance. A reactionary development is mentioned by the Alexander Hamilton Institute as apparently under way, but it believes that the recession is likely to be brought to a halt this summer; any dip now is expected to prove temporary.

Forecasts are moderately hopeful, though most of them emphasize that time is one important element. The Brookmire analysis is that "production of goods has apparently been below even the reduced rate of consumption for half a year or longer," so that a rising volume of business is warranted to start in the relatively near future and lasting well into 1932. That the rise will be slight rather than high is the suggestion.

"Wholesale commodity prices are near bottom," continues this forecaster, "with raw materials deflated, while finished goods will lag in the rise and retail prices will decline further. . . .

Time for Advertising Efforts

"Selling and advertising efforts should be prosecuted more vigorously, raw materials can be bought a year ahead, finished goods can be stocked in order to assure customers prompt delivery when demand revives, and advantage can be taken of opportunities to pick up any competitors' plants that may be available at attractive terms."

For signs of a revival, the Alexander Hamilton Institute advises a watching of full freight car loadings. The point is that the less carload shipments are a measure of close range buying, while a pickup in full car loads will form a strong indication of a revival of demand on more than a hand-to-mouth basis.

Comments on the international meeting of business men in Washington are expressions of regret that the way out of the depression was not shown and at the same time admissions that nothing of the kind could be expected.

The down trend of building costs and the question of maintaining buying power and the standard of living are discussed at length in the May letter of the National City Bank of New York. What is temporarily affecting the standard of living, says the bank, "is not cuts in wage rates in reasonable proportion to declines in the cost of living, but the inability of American employers who are unable to reduce costs (including wage costs) and selling prices to the market's requirements, to give work to American workmen.

"Standards of living are determined not by the number of dollars per hour or day a man is paid for working, but by what he can buy with the total number of dollars he receives."

Building Costs Decline

In the matter of building costs the bank refers to the studies of the George A. Fuller Co., which show that since December, 1929, when the index of building costs was 207, there has been a decline to 186 on April 1, or 10 per cent. "As wage rates in the building trades have not been reduced, this decline is attributable to lower material prices and increased productive efficiency. . . ."

Reductions in building costs through technical improvements are being made to a greater extent "off the job" than on it; that is, in the cheapening of the many fabricated articles that enter into construction and ornamentation. Economies in these lines are being passed on in prices by the rigorous competition that exists, and a number of wage rate reductions have occurred in the supply trades."

& Eisen, Western Pacific Building, are architects.

S. Birkenwald Co., Twenty-second and Pettygrove Streets, Portland, manufacturer of refrigerators, refriferator counters and kindred equipment, has asked bids on general contract for one-story plant unit, 100 x 100 ft., to cost about $65,000 with equipment. R. R. Clark, Railway Exchange Building, is architect and engineer.

Board of Control, State House, Salem, Ore., is considering erection of a new central steam-operated electric light and power plant, to cost $150,000 with equipment. State engineering department will be in charge.

State Department of Education, Sacramento, Cal., has plans for addition to Preston State School of Industry, Ione, Cal., to cost about $60,000 with equipment. R. G. Lappe, 1710 Franklin Street, Oakland, Cal., is architect.

Consolidated Steel Corpn., Ltd., Los Angeles, has plans for a building, 120 x 750 ft., to house its welding department.

Fellows & Stewart, ship builders, Terminal Island, Los Angeles Harbor, have secured contract for 10 38-ft. cruiser yachts for S. Clyde & Kyle Co., New York.

Golden State Culvert Mfg. Co. has commenced manufacture of steel pipe culverts at 2535 East Fourteenth Street, Los Angeles.

United Airports Co. of California, Ltd., has placed contract with Austin Co. for a one-story machine shop, 30 x 240 ft., at United Airport at Burbank, Cal., to cost $50,000.

Boeing Airplane Co., Seattle, has placed contract with Austin Co. for a hangar and machine shop, 120 x 200 ft., at Boeing Field, to cost $65,000.

Foreign

PLANS have been completed by Ford Motor Co., Dearborn, Mich., for new one-story assembling plant at Mexico City, Mexico, 400 x 600 ft., to cost over $500,000 with machinery. It is understood that general contract will be let to J. A. Utley, Penobscot Building, Detroit. Albert Kahn, Inc., Marquette Building, same city, is architect and engineer.

Group headed by International Power Securities Corpn., operated by Aldred & Co., 40 Wall Street, New York, and United States & Overseas Corpn., an interest of Harris, Forbes & Co., 56 William Street, New York, have purchased controlling interest in Berlin City Electric Co., Berlin, Germany, for reported price of $120,000,000. Purchasing interests plan expansion, including line construction. Prussian Electric Co., State of Prussia, Germany, will be interested with American group in acquisition.

Bids are being asked until June 10 by Bureau of Yards and Docks, Washington, for one 30-ton revolving crane for naval operating base at Pearl Harbor, T. H.; until June 17 for one tank for submarine training service at same location.

Plans are being completed by Soviet Russian Government, Moscow, through Soyusmiaso (United Meat Packing & Refrigeration Industry), for two new meat-packing plants at Moscow and Semipalatinsk, to cost about $15,000,000 including machinery, still to be purchased, comprising mechanical-handling equipment, refrigeration and other machinery. Additional plants will be built at other locations later. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

Cerveceria del Norte, Monterrey, Mexico, is planning erection of two-story brewing plant, with machine shop, boiler plant and other units, to cost over $275,000 with equipment.

Kreuger & Toll, Stockholm, Sweden, operating match manufacturing plants in different countries, is arranging for concession for a match plant at Bogota, Colombia. Company will loan Government 20,000,000 pesos (about $19,400,000) and will proceed with erection of new plants. Initial works will cost over $2,000,000 with machinery.